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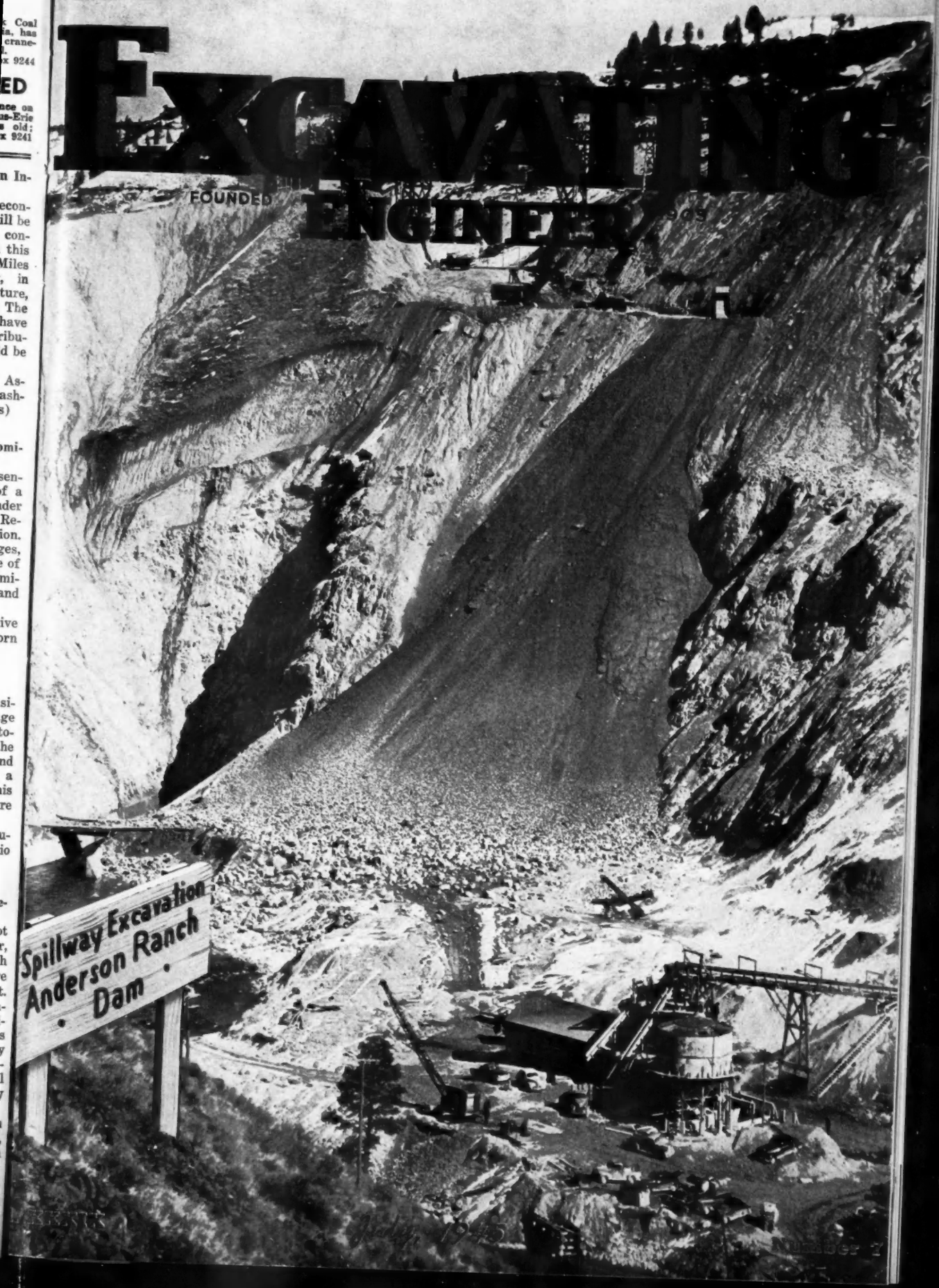

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EXCAVATING ENGINEER

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Some day water will hurtle 339 feet over this abutment of Anderson Ranch Dam from the crest of the spillway to a level above that of the concrete mixing plant in the lower right. The Bureau of Reclamation has completed 88% of the structure which will be the highest earthfill dam in the world.—U. S. Bureau of Reclamation Photo

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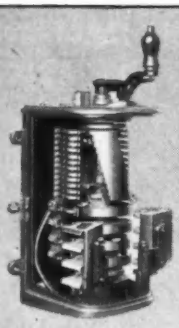

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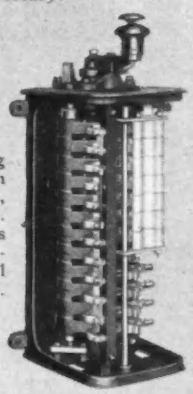

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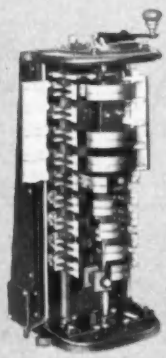

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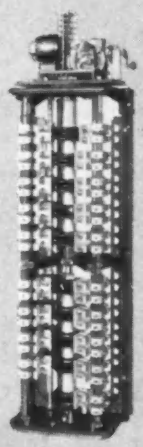

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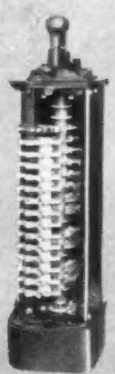

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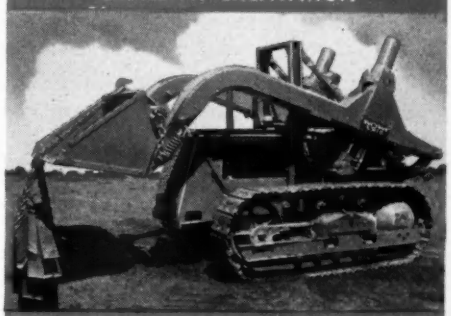

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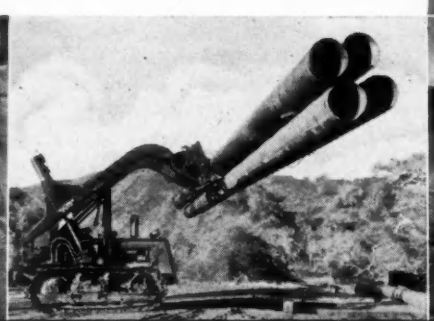


CULVERT PIPE

ROAD CONSTRUCTION

Basements by the Thousands

J. A. Danens & Son Company of Minneapolis see progress made in excavating business from horse and scraper days of 32 years ago. Use a ¾-cu. yd. power shovel and dragline of same size to average about 450 basements a year.

OVER 10,000 BASEMENTS ago J. A. Danens used horses and scrapers in his excavating business in Minneapolis which was confined to about nine months of activity a year when the ground was free of frost. Now, 32 years later, Danens uses two power shovels, with dragline attachments, five 4-cu. yd. end dump trucks, a bulldozer, two equipment-hauling trailers, and a pick-up truck in his business of digging an average of from 400 to 500 basements a 12-month year. Danens' son, Calvin (Sonny), who started operating shovels for his father in 1936, is the "Son" part of the company's present name, J. A. Danens & Son.

Although the company does other excavating work from time to time, the principal work is basement excavations. When other than basement excavation work is undertaken the jobs are usually confined to 20,000 cu. yds. and less.

J. A. Danens & Son bought its first power shovel, a Bucyrus-Erie 10-B ⅜-cu. yd. gasoline shovel, in the fall of 1936 and then bought three more 10-B's in successive years. In 1939 Danens was operating two 10-B's on a sewer job and the other two were each excavating an average of two basements a day.

Later, a great deal of the work was obtained by the company, grading, landscaping and making driveways on large estates. It was felt that a larger shovel would be more efficient for this work, and at the same time increase production on basement excavations, and so in October, 1939, Danens purchased a Bucyrus-Erie 20-B ¾-cu. yd. gasoline shovel with a dragline attachment consisting of a 40-ft. boom, a jib, and two ¾-cu. yd. buckets, a Bucyrus-Erie type AX bucket for ordinary digging and a Bucyrus-Erie type AY bucket for heavier digging.

In May, 1941, a Bucyrus-Erie 22-B with a ¾-cu. yd. shovel and 60-ft. crane boom front end was added to the equipment and in March, 1944 this machine and the 20-B were taken to Omaha, Nebraska, where they were worked for three months on the construction of a bomber plant.

The shovels were trucked to Omaha on equipment trailers, designed by C. J. Danens, the son, and manufactured by Wheel Service Co. of Minneapolis. One trailer is a 25-ton tandem axle, gooseneck design using an EHT Mack tractor. The other trailer is a single axle 18-ton unit coupled to one of the company's five EH Macks

• Left: Bucyrus-Erie 20-B crane using a 1,800-lb. "skull cracker" to break ground with a 2½ to 3-ft. freeze ahead of the shovel. Center: Danens uses a ¾-cu. yd. shovel to excavate a channel of basements. Right: Truck dumps excavated material for fill in a nearby area.

equipped with St. Paul "Hi Dumper" hoists and scoop end bodies.

Previous to the war when there were no restrictions on home construction, J. A. Danens & Sons used its shovels almost exclusively for digging basements 12 months a year. They averaged three basements a day when the ground was not frozen and one a day when it was frozen. Eighteen to 20 men were on the payroll at the time.

During the past year the Federal Housing Administration has authorized the construction of several hundred homes in the Twin City area and J. A. Danens & Son has been again busy with basement excavations.

Many of the homes being constructed in Minneapolis under the present FHA authorization are in a subdivision near the Minneapolis-St. Paul Wold Chamberlain Airport. Last fall Danens excavated 80 basements in this district for E. J. Hoy, local building contractor. One of the jobs done in this subdivision last winter is typical of the performance of J. A. Danens and Son Company's equipment and personnel.

It was below zero when the job of excavating the basements for 11 homes along one street was started. The ground was frozen to a depth of from two and one-half to three feet. Using the 20-B crane equipped with an 1,800-pound iron ball, or "skull cracker," the ground was broken ahead of the 22-B shovel that did the excavating. The ball was dropped from a height of about 20 feet approximately every two feet of the area to be excavated.

The homes were to be 26'x32' each and the basements were excavated by digging a long channel the depth and width of the basements. The material, a clay and sandy loam, was loaded by the Bucyrus-Erie shovel directly to the five trucks and hauled two blocks away for fill. Top soil was stockpiled for future top dressing and piles of excavated dirt were left at the top of the "channel" in the ten locations that would be the area between basements. Each basement excavation involved about 250 cu. yds. and no hand labor was necessary to finish them.

After the basement blocks were laid the dirt left piled on the channel bank between basements was filled in by Danens with their Caterpillar D-4 tractor equipped with a LaPlant-Choate bulldozer. The bulldozer was also used for backfilling at the front and back of the basements and for spreading the topsoil dressing.

The time to move the shovel in and out of each basement excavation was saved by this "channel" method which was readily adaptable here since all the basements were the same length and depth and the homes were built adjacent to each other. The contract was finished in almost summer operating time of three basements a day.

Cost figures indicate that Danens' shovel and dragline each use about 25 gallons of gasoline an eight-hour day in moving an average of 900 cu. yds. of material each. The 22-B shovel keeps three trucks busy and is operated by Sonny Danens, who is also the mechanic for the company. Both Sonny Danens and John Wondra, operator of the 20-B dragline, with Clifford Wilcox, operating the second shift on either machine, have great pride in the appearance of their machines, even to the length of keeping a dusting cloth in the cabs which they use several times a day. At the end of the day each machine gets a thorough cleaning, inside and out, and the floors of the cabs are as clean as the kitchen floor of the ordinary home. In addition to the operator each of the machines has an oiler. Regular eight-hour shifts are worked by the crews, although longer hours are worked in cases of emergency.

The dragline has the advantage in basement excavation of being able to load trucks pulled up to the curb of the street without making it necessary to run the trucks over sidewalks on improved streets. The dragline can also cast the dirt to fill trucks in an alley without making it necessary for the trucks to travel over soft ground up to the excavation.

The 20-B was bought in October, 1939, and the only repairs that it has required were to have the head taken off and the valves ground in 1944. No repair work has been done to date on the 22-B which was purchased a year and one-half later. Danens attributes the lack of breakdown and trouble to consistent maintenance. A. Leschen and Sons wire rope is used exclusively on both machines.

• Left: Topsoil stocked for future top dressing when basement excavations were started is dumped between two basements after blocks have been set. Right: Caterpillar D-4 tractor with LaPlant-Choate bulldozer spreads topsoil dressing and grades around the houses.

• Left: Shovel digs itself in to start a new basement excavation. Right: Grading ground in front of houses to sidewalk this Bucyrus-Erie 20-B ¾-cu. yd. dragline loads truck back to curb.

Dragline Practices

By
LEE DuBOIS
(Bucyrus-Erie Co. Service Engineer, Seattle, Wash.)

Practical methods and helpful hints on the most efficient operation of draglines under varying conditions.

GREATER SKILL and experience in the efficient handling of draglines result in low maintenance cost, longer life, and maximum yardage. Varying conditions of operation require different methods to get the best performance from draglines, and some of these methods and helpful hints observed through the years are given here.

One of the important points an operator should remember for better dragline performance is to keep the boom at the highest angle that will give the reach needed for a particular job. Do not use a bucket of larger capacity than recommended for normal rapid operation. The gain of more material being moved per pass with a larger bucket is usually offset by less passes per hour, and in addition, overloading always results in extra maintenance and delay. It is also good practice to keep bucket teeth sharp and built up to proper size to protect the lip from unnecessary wear, as well as to increase digging speed.

In starting a job it is important that the operator move the machine close enough to the work to establish a level or grade. If the job is started right the machine will always be within reach of the work. Each successive move should only be such that the work is easily reached for nothing is gained by moving the machine farther than is warranted by the easy reach of the work.

There are instances where it is utterly impossible to reach the work and there is no profit in experimenting with these places. Whether it is ditch work or in borrow pit, the movement of the dragline should only be enough so that the bottom of the last cut can be reached without throwing back the bucket. Very little profit is ever made by slinging the bucket.

In ditch work it is important that the outlet be down to grade or a little below so that the outlet will not easily choke up with sediment or debris. Water is usually present in ditching and when this is the case the water can be used to gauge a level for depth quite accurately. To dig a ditch efficiently it may be necessary to build a road out far enough to reach the 0-0 stake and then dig the road out as the machine moves back.

In levee work the job must tie in with adjoining levees or with high ground. These "tie in" points are often subject to much water pressure and consequently are important. As

in ditch work, the dragline must be spotted so that the work can be easily reached. This means that the dragline must be placed close enough to the work so that excavated material can be placed in the levee without casting it there by slinging the bucket. If necessary, it will pay to build a road to get the machine close enough to the work.

Moving Forward

A dragline operator can most easily gauge his move-up by suspending the bucket vertically from the boom point. Beginners will want to move forward enough so that when the bucket is lowered vertically it will fall just behind the last cut in the bottom of the pit, but experienced operators will want to move a little farther forward since the bucket will come back a little as it is swung into the pit. In either case, however, the drag cable should be held without slack. Deep work necessitates shorter moves than shallow work.

No operator can dig a straight slope line without an accurate guide. A ploughed furrow is the best guide, but if a plow is not available stakes set close together can be used as a guiding line. It is also possible to use a trench cut to establish a slope.

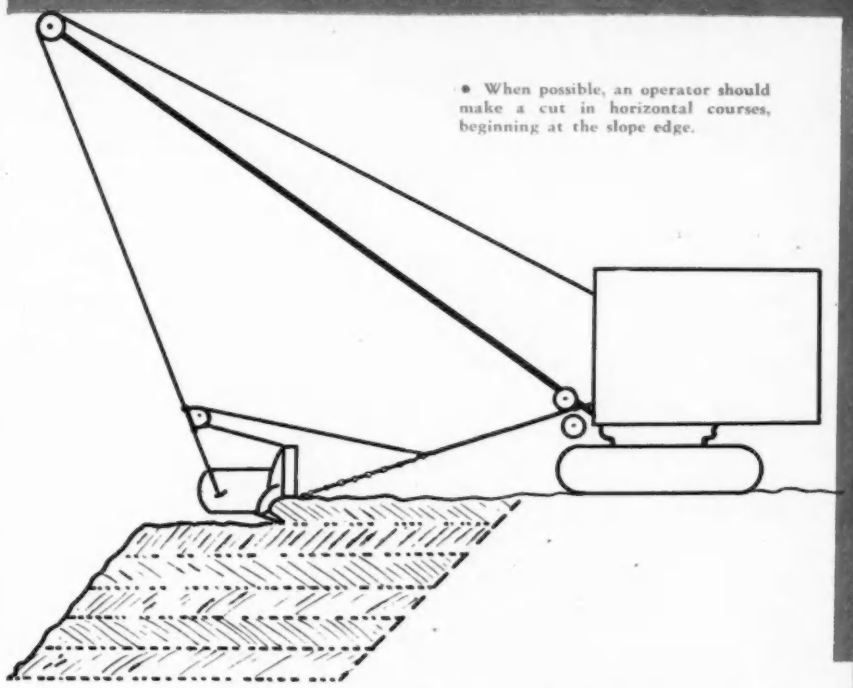
Wherever possible an operator should make a cut in horizontal courses, beginning at the slope edge. As the work progresses deeper the course should be taken deeper next to the slope in order to hold the bucket against the slope. Steep slopes are dug with the corner of the dragline bucket and flat slopes are dug with the bottom of the bucket. Fill the bucket with an even cut and be sure you are getting back corners filled. Avoid "gouging" and heap the bucket.

No operator can maintain a specified grade or slope without occasionally checking the angles of the slope and the depth of the cut. The frequency of this checking should depend on the experience of the operator, but the dragline should not be moved for the next cut until the operator is sure that the last move was completed correctly.

The first course of the cut at each move-up should be brought in close enough to the machine so that when the cut reaches the bottom the operator can see what he is doing in the bottom. No operator can accurately know what he is doing if he cannot see his work.

Taking off the top layer of material close into the machine avoids the necessity of constantly pulling the drag cable through abrasive material.

A good dragline operator takes care not to bring the bucket in too close to the fairlead for if the three-way bucket hitch hits the fairlead it may injure it or cause the drag cable to break.



• When possible, an operator should make a cut in horizontal courses, beginning at the slope edge.

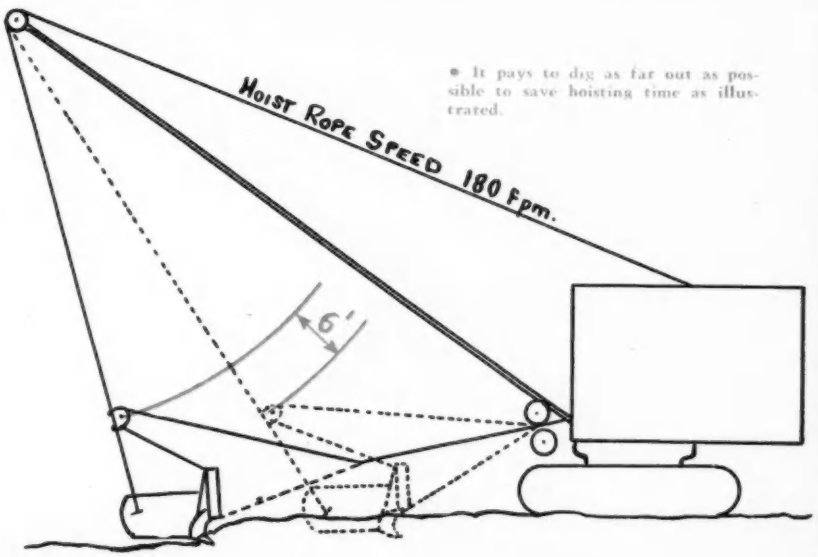
More dirt can be moved in less time by digging "far out" in some kinds of material or at a certain stage of the digging on each move of the machine. There is nothing gained by constantly digging so close to the machine that time is lost bringing in the bucket to the cut. For an example, if the hoist rope speed of a dragline is 180 f.p.m., for instance, and the bucket is pulled in so far that an unnecessary lift of six feet is required, an extra two seconds will be wasted every digging cycle. If a machine with a 1-cu. yd. bucket makes two cycles a minute it would mean that by wasting two seconds each cycle, about 1,920 seconds would be wasted in an eight-hour day, or about 64 cu. yds. a day wasted. Similar wasted time is also involved in other parts of a digging cycle.

Providing the operator can see what he is doing and does not drag the cable through a pile of abrasive material, it pays to dig as far out as possible without making it necessary to swing the bucket back or lose time by the recovery of slack cable.

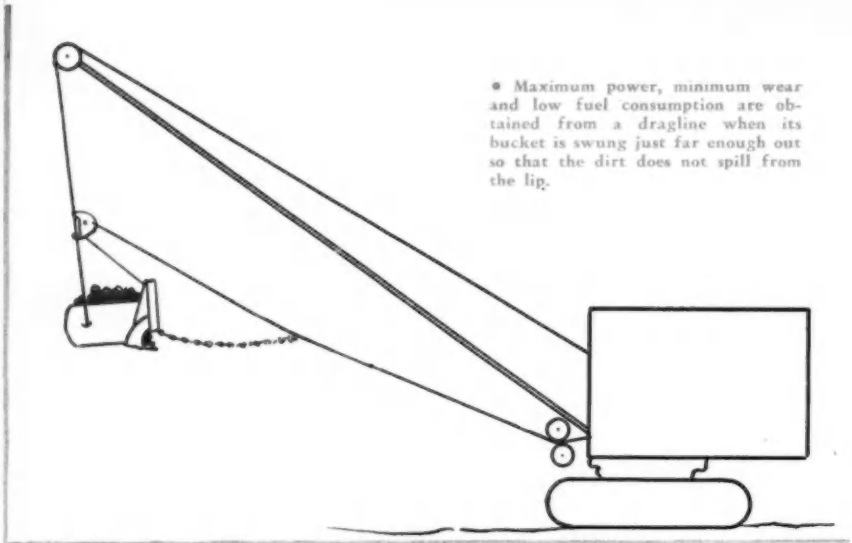
It is advisable not to pile dirt on your "door step." Hoist bucket from digging as soon as it is filled. Piling up dirt under the boom-foot wastes time and power and also builds a "wearing" trap for the drag-rope.

Drag Brake

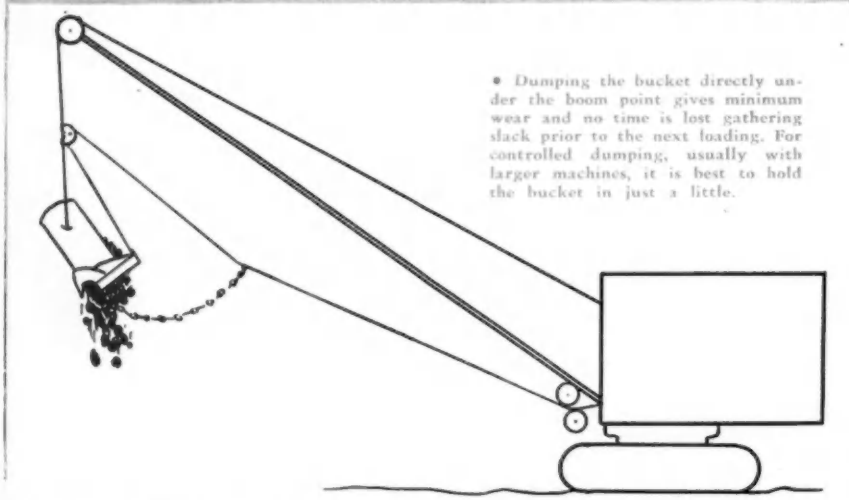
The drag brake governs to a very great extent the skillful operation of a dragline. Old-time operators often



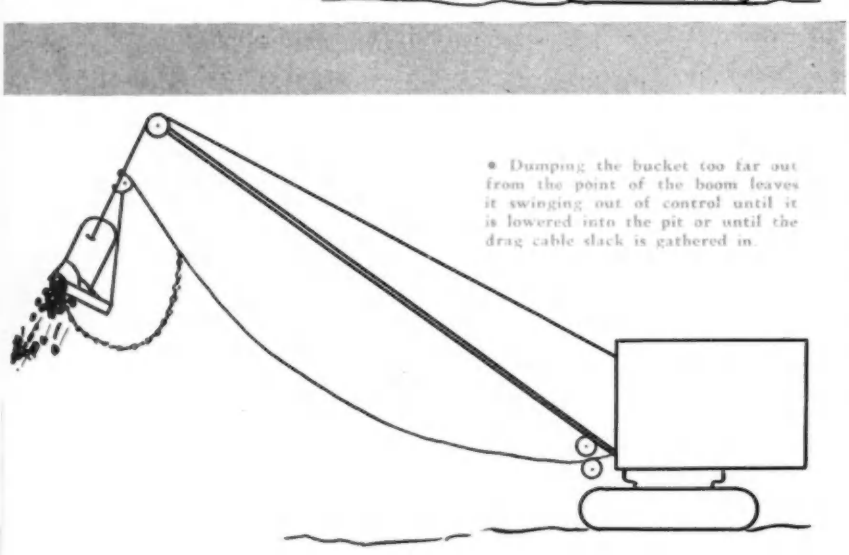
• It pays to dig as far out as possible to save hoisting time as illustrated.



• Maximum power, minimum wear and low fuel consumption are obtained from a dragline when its bucket is swung just far enough out so that the dirt does not spill from the lip.



• Dumping the bucket directly under the boom point gives minimum wear and no time is lost gathering slack prior to the next loading. For controlled dumping, usually with larger machines, it is best to hold the bucket in just a little.



• Dumping the bucket too far out from the point of the boom leaves it swinging out of control until it is lowered into the pit or until the drag cable slack is gathered in.

said that a dragline operator s brains must lie in his feet. The condition of the drag brake must be such that it responds accurately to pressure on the foot pedal and release smoothly. It must not grab on application and must release as smoothly when the weight that rolls the drag drum is only the empty bucket, as when it is heavily loaded.

The fit of the band is the most important feature of a smooth releasing brake which holds its maximum load without slipping. The band must be kept clean, free from grease and its lining must be kept in good shape.

The band must form a true circle around a true running brake head with an unscored smooth surface. The anchor must not wobble in any direction. The loop on the dead end of the band and the dead end pin must be in absolute alignment with the center line of the drum shaft. The center of the circle that the brake band makes must coincide with the center line of the drum shaft.

When the brake is not in use it is important for the operator to release the band enough so that contact does not produce wear by dragging. If the band drags, or the operator "rides the brake," the band will heat and expand, lessening its efficiency.

No foreign substance of any kind should ever be used on a dragline brake band. The use of such materials as graphite, Fullers earth, rosin, lye, talcum, dust, etc., is only an admission that the parts are not in good shape or that their adjustment is incorrect.

Whether the release of the band is governed by external springs or the spring action of the band alone, it should operate in a similar manner. Application of a dragline brake should begin at the dead end and progress evenly around the band. When pressure on the operating pedal is released, the release of the band should start at the free end of the band and progress evenly around to the dead end. Failure to release the drag brake smoothly may cause the bucket to bob up and down and this action may cause the machine to settle deeper in soft dirt. If the brake is operating properly the band should not touch the brake head anywhere when the pedal comes all the way back. To insure a cool brake head and band, many operators take their foot entirely off the brake pedal when the brake is not in use.

Drag Chains

The length of drag chains is very important to the smooth operation of a dragline. When the drag chain is too long it is impossible to bring the

bucket in close to the machine for close digging or setting mats. Long chains lessen the ability to pick up the bucket cleanly, causing a roll of dirt to form in front of the machine where the drag cable is likely to carry it into the machine.

Drag chains wear most at the bucket end and so many cubic yards of production can be added to the life of a chain by changing ends. Sometimes it is advisable to cut chains in two at the midpoint and recouple them with the original ends in the middle to put the unworn portions at the ends where the wear is the greatest.

Keep fairlead sheaves well lubricated and replace worn bushings promptly. It is good to make it a regular practice to clean out any dirt brought in by the rope.

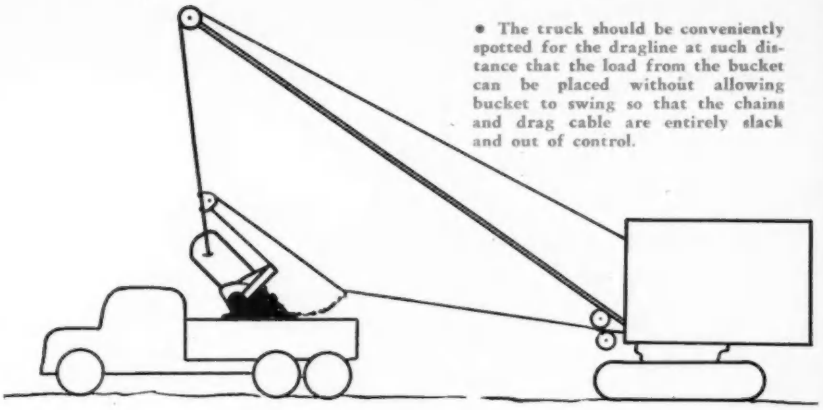
Although the dragline is potentially a versatile and efficient piece of excavating equipment, the degree of its efficiency is entirely dependent upon the proficiency of the operator and upon proper care and maintenance. A good piece of equipment deserves the best care if it is to pay off in low upkeep, cost, longer life and maximum yardage.

Dumping

If an operator holds a dragline bucket too close in to the machine while hoisting, the forces on the ropes are high and cause excessive wear on the dump line, dump sheave, hoist line and point sheave, drag cable, fairlead, drag brake and all gears. This also cuts down power and speed and uses more fuel. When the bucket is carried on the swing out to a point just so that dirt does not spill out of the front end, the operator gets maximum power, minimum wear, and low fuel consumption from his dragline.

Minimum wear occurs when the bucket is dumped directly under the boom point and no time is lost gathering slack prior to the next loading. Dumping directly beneath the boom point also prevents the bucket from swinging back and forth out of control while it is being lowered to start the next digging cycle. Dumping the bucket too far out from the point of the boom leaves the bucket swinging out of control until it is lowered into the pit or until the drag cable slack is gathered in. No more slack than is necessary should be allowed in the drag cable when dumping sticky material. The use of a shorter drag cable requires rough handling of the bucket at times, but of course, this rough handling should be held to a minimum.

Wherever it is practical it is a good policy to level a road for the dragline before start of operations for this will prevent a waste in production when it becomes necessary to level the road for each move. All draglines work more efficiently when sitting level.



• The truck should be conveniently spotted for the dragline at such distance that the load from the bucket can be placed without allowing bucket to swing so that the chains and drag cable are entirely slack and out of control.

Where it is necessary to make fills or level rough ground, it is generally a good policy to move up close to the work area, cast a good pile, and then level off in courses rather than attempt to level each bucketful as it is cast.

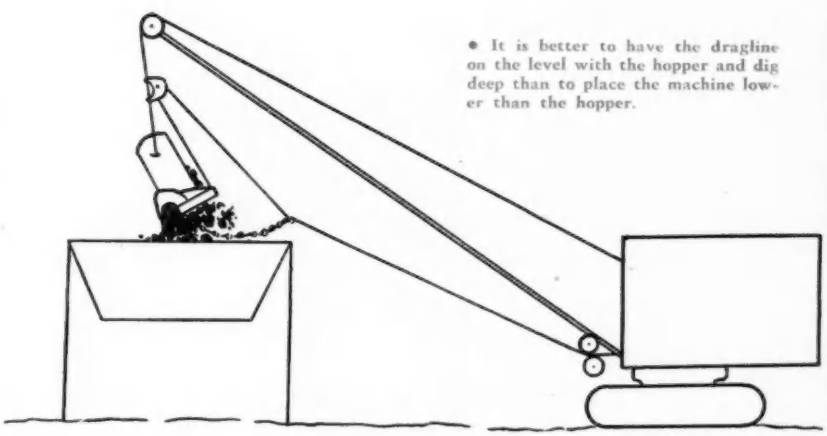
For efficient truck loading performance the truck should be spotted at the most convenient place for the dragline, either with the rear of the truck pointing to center casting of the machine or with rear of the truck pointing toward the pit and its side toward the dragline operator. Never swing the bucket over the cab or motor of the truck for dislodged material may damage the truck. The dragline and truck should be spotted at such distance apart that the load from the bucket can be placed in the truck without allowing the bucket to swing back so close that the chains and drag cable are entirely slack and out of control. However, don't have the dragline and truck so close together that it becomes necessary for the operator to hold the bucket in while dumping and wait for the dirt to trickle out of the bucket. The swing distance from point of loading to point of dumping should be as short as possible and the bucket should not be dumped high above the truck.

When dumping into any kind of a hopper it is more efficient to place the dragline at the correct dumping distance from the hopper than to place it convenient to the pit. It is better to have the dragline on the level with the hopper and dig deep than to place the machine lower than the hopper. The necessity of using high sideboards or hitting sideboards indicates a poor operator.

Use of Mats

Mats 16 ft. long, four feet wide, and nine inches thick are of satisfactory size for holding draglines from 30 to 45 tons. A smaller size mat for this weight machine is not advisable. Mats should be laid crosswise under the

(Continued on page 405)



• It is better to have the dragline on the level with the hopper and dig deep than to place the machine lower than the hopper.

• Stripping an average of 19 feet of overburden down to a six-foot limestone formation over the coal vein, this Bucyrus-Monighan 5-W walking dragline with a 6-cu. yd. bucket on a 120-ft. boom deposits to a spoil bank well back of the face.

Stripping Kentucky Coal

OPEN PIT COAL MINING operations were started on the 100-acre property located at Madisonville, Kentucky, by the Rutstein Coal Mining Company in January, 1944. The Badgett Construction Company of Memphis, Tenn., is the contractor for Rutstein and the Badgett Mine Stripping Company of Memphis is subcontractor for removing an estimated 3,200,000 cu. yds. of overburden so that about 1,000,000 tons of West Kentucky No. 11 vein soft coal can be loaded and hauled to the tipple by Chandler Bros. Inc. of Virgilina, Va.

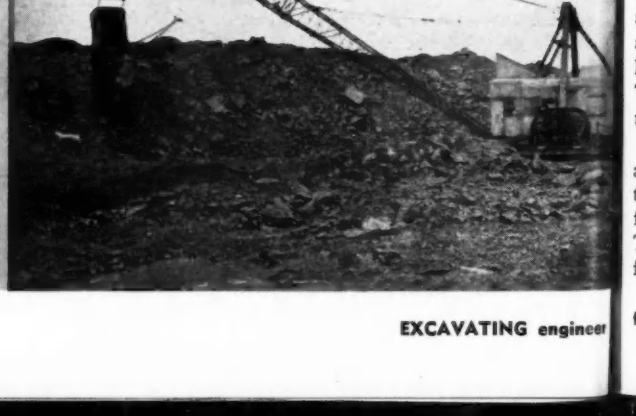
The Badgett Construction Company, which averages about $1,000,000 worth of construction work annually, was organized at Memphis in 1922. The company has built roads and bridges in the South for eight years, did river improvement work for the War Department for 12 years, excavated a section of the Florida Canal at Oeala, Fla., in 1935, built 14 miles of Florida State Highway 26 in 1937, and stripped over a million tons of bauxite in Arkansas in 1942 and 1943.

Superintendents of the three companies involved in the operation are: Joe B. Scharmahorn, Badgett Construction Company; Rogers Badgett, Badgett Mine Stripping Company; and George Chandler, Chandler Bros., Inc.

The overburden in this mine has an average depth of 25 feet, including six feet of limestone, with a maximum of 30 feet and a minimum of 12 feet. There are places where the coal vein

• After the rock formation over the coal vein is drilled and blasted this Bucyrus-Monighan 5-W with 6-cu. yd. bucket on a 100-ft. boom deposits the rock on the near side of the spoil bank established by the other dragline.

Badgett Construction Co. of Memphis, Tenn., strips 3,200,000 cu. yds. of overburden from 100-acre Kentucky coal mine with two Bucyrus-Monighan 5-W walking draglines. Five 22-cu. yds. Euclid trucks haul 1,000,000 ton of coal loaded by two Lorain 1¼-cu. yd. shovels.



outcrops. The overburden consists of 2,560,000 cu. yds. of clayish loam and 640,000 cu. yds. of hard limestone.

About 25 per cent of the site is covered with heavy timber and the remainder is open field. A Caterpillar D-8 tractor with bulldozer is used for clearing the site, which is done from time to time as needed to clear the way for the strippers. There is a small sawmill on the site for preparing merchantable timber and the balance of the overgrowth is deposited in the old pits.

Two Bucyrus-Monighan 5-W walking draglines are used for the stripping at this mine. One of the stripping draglines has a 100-ft. boom and the other has a 120-ft. boom. Both are equipped with 6-cu. yd. buckets. Bucyrus-Erie, Esco, and Page buckets are used.

The overburden is stripped in single 70-ft. wide cuts to the rock formation about six feet over the top of the coal vein. This earth is deposited to a spoil bank well back of the face by the Bucyrus-Monighan with the 120-ft. boom. The rock is then drilled and shot and deposited by the 100-ft. boom machine on the near side of the spoil bank. Before excavating the shot rock the 100-ft. boom dragline deposits a blanket of about a foot of dirt on the rock and works from on top of this blanket, to protect its tub, averaging about 150 cu. yds. of rock an hour.

Working two 11-hour shifts a day, six to seven days a week, the two draglines strip on an average of 200,000 cu. yds. of overburden a month. Stripping is carried on for 12 months of the year but production is somewhat less during the winter months.

In addition to the operators and oilers on the draglines, four men are employed in the pit of this mine. Two men clean coal and do other miscellaneous work. The strippers are lubricated by oilers who are on duty all of the time. Dragline buckets are built up by giving them a solid coating of hard surfacing material and then laying a bead pattern on the parts that get the hardest wear.

The Bucyrus-Monighans are powered by diesel engines and use approximately 10 gallons of diesel oil an hour. Texaco and Standard oils are used and delivered to the draglines by the oil companies in trucks. The machines are refueled approximately every other day.

A Caterpillar No. 12 power grader and LeTourneau bulldozer attached to a Caterpillar D-8 tractor are used for cleaning up around the strippers. The power grader is effectively used for cleaning the top of the coal bed before the coal is loaded for the tipple.

• Above: Two Cleveland wagon drills, mounted on a Caterpillar D-4 tractor and powered by a 500-cu. ft. Gardner-Denver portable compressor, drill vertical 1¾-inch holes from four to six feet into limestone. Right: Power plant for furnishing light for night drilling is housed in old 6-cu. yd. dragline bucket with steel plate welded over top to give protection from flying rock during blasting operations. Bucket-housed plant is pulled to various locations by a tractor.

Two Cleveland wagon drills mounted on a Caterpillar D-4 tractor and powered by a 500-cu. ft. Gardner-Denver portable compressor are used for preparing the limestone for blasting. The drill rigs are equipped with auxiliary air receivers. Vertical holes, 1¾ inches in diameter are drilled from four to six feet into the limestone, depending upon the depth of the stone. Timken detachable bits are used. Bits are not resharpened.

Inside threads are made in the top of the drill steel. When this steel gets plugged with rock the unfilled portion of the steel is filled with oil and then the steel is attached to a hydraulic jack. Over 15,000 pounds of pressure is available to force out the rock in the drill. The company never loses any drill steel because of it being plugged.

Holes drilled next to the high wall are on three-foot centers and the other holes are spaced six feet apart in rows six feet from each other in a square pattern.

Drilling is done for two 10-hour shifts a day for six days a week during all 12 months of the year.

The holes are loaded with 1½-inch American 40 per cent gelatine explosive manufactured by the American Cynamid Co. and are exploded by an American electric detonator. A 7½ kw generator is used to make the shot. The ratio of explosive to blasted material is ⅞ lbs. of explosive to a cu. yd. of rock. Blasting is usually done daily at 6 p.m. and occasionally as many as 1200 holes are shot at a time. The average number of holes blasted at a time is 450 to 550. Practically no secondary blasting is found necessary and what little is done is handled by a jack hammer.

The ratio of overburden to coal mined is 3.6 to 1.0. The coal vein has an average uniform thickness of six feet and although the vein slopes, this

slope is so slight that it is practically level as far as mining is concerned.

Chandler Bros. uses two diesel 1¼-cu. yd. Lorain shovels working one 10-hour shift to load over 2,000 tons of coal a day. No blasting is necessary for coal loading. Approximately 60,000 tons of coal are loaded a month and the production for the first year was 739,000 tons. Maximum monthly coal production is 72,000 tons.

The coal loading shovels work about a week behind the strippers. In dry weather the Euclid hauling trucks run on the fire clay beneath the coal seam and in wet weather they use the top of the coal seam for a road and are spotted at the shovel on top of the coal vein.

The five 13-cu. yd. Euclid bottom dump trucks used by Chandler Bros. for hauling coal have extension beds that bring their capacity up to 22 cu. yds. each, and they haul on an average of 17 tons of coal a load. The trucks are powered by Cummings diesel engines and use about three gallons of fuel an hour, the same amount of fuel used by the tractors in the mine. The trucks are refueled and lubricated daily, at night.

The average truck haul is 3,000 feet each way and each truck can make four trips an hour. The hauling road which averages at least 40-ft. in width is built of pit run limestone two feet thick and surfaced with refuse coal continuously. The hauling road is kept level through the use of a patrol grader. The maximum grade of the road is 10 per cent and there is 1,500 feet of hauling road built in the mine and the remainder of the hauling distance is in the pits. Average road grade is five per cent.

• **Rogers Badgett, superintendent of Badgett Mine Stripping Company.**

The trucks dump the coal into a 60-ton hopper and it is shipped from the mine unwashed in railroad cars. The Badgett Construction Company's contract terminates with the dumping of the coal into the hopper.

To handle drainage, which is not a major problem at this mine, a 12-foot wide diversion ditch a mile long was built along the upper side of the property, and a levee 3,000 feet long and 12 feet high was built on the low side of the property. No outside water gets into the mine and there is very little seepage. Disposal of rain water provides the only problem. An inside drainage ditch drains the unmined property to the low side where an 18-inch Couch special low lift drainage pump lifts it over the levee. Pit water is handled by Jaeger six-inch, Morris four-inch, and Jaeger three-inch pumps.

This mine is in the bottom lands on the Green River headwaters, about 80 miles from the Ohio River. In 1937 the Ohio River back-water was from six to 18 feet deep on this property. This spring the Ohio River came within 12 inches of overflowing the mine's levee. If the water had topped the levee Badgett Construction Company would have had to pump 35 feet of water from approximately 60 acres. During the three weeks that the water level was hovering near the levee top the stripping units were moved, but coal loading, drilling, and shooting rock under this 35-foot head of water continued without interruption.

The Badgett Construction Company maintains its own shop at the mine equipped with power drill, small lathe, heavy hydraulic press, power hack-saw, three portable welders and one electric welder. Six men are employed in the shop where all repair work and welding on the mine equipment is done.

Coal mined here is used principally by railroads and power plants.

• **Left: One of two Lorain 1¼-cu. yd. diesel shovels used by Chandler Bros. to load out an average of 2,000 tons of No. 11 vein coal a 10-hr. shift. Below: The five 13-cu. yd. Euclid bottom dump trucks with extension beds that bring their capacity up to 22-cu. yds. each ready to start a 10-hr. shift of hauling coal to a hopper from where it is loaded to railroad cars.**

A different Johnny is marching home

For one thing, he won't parade up Main Street the way you always expected. He doesn't much care for the ticker tape and bunting. By day coach or sleeper, Johnny is coming home with the experiences of battle vivid in his memory.

He may be back for the job he left when the call to colors came. You know you'll be proud and happy to have him with you.

But it's a *different* Johnny. Not quite the happy-go-careless guy you knew before. He's older for one thing. More thoughtful. You may even find him brusque or restless now and then.

Why?

When a man's been through the hell and pandemonium of battle . . . or the terrible boredom of lonely, inactive outposts, it's hard to readjust to a paradise of peace and plenty. It will take Johnny time to settle in a civilian groove, and the call's on you for friendly tact and patience.

Pull with Johnny. Give him time to come through at home, as he came through on the fighting front. Play ball with Johnny. He made a swell soldier. And he's going to make a swell civilian.

MACWHYTE COMPANY, 2903 Fourteenth Avenue, Kenosha, Wisconsin . . . manufacturers of "Hi-Fatigue" Aircraft Cable, "Safe-Lock" Cable Terminals, Aircraft Tie-Rods, Braided Wire Rope Slings, and Wire Rope for all requirements.

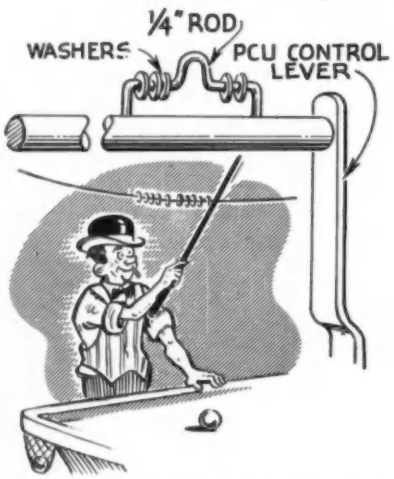
Field NOTES

Load Counter

Here is a little idea I ran across in civilian life: It's a system for keeping track of the number of trips made or loads hauled daily with a scraper. It consists of a ¼" rod and some washers attached to the Power Control Unit lever, or any other convenient place on your rig. Place the washers on the rod, and fasten the rod down at each end. The supply of washers is kept at one end of the rod. As each trip is completed, move a washer along the rod to the other end. The loop in the middle of the rod will prevent the washers from vibrating back together.

I have found this better than making a mark on the dashboard of the tractor.

By Bob Fleming,
From *LeTourneau Co-Operator*.



• Washers on a ¼-inch rod attached to the Power Control Unit lever help keep track of number of trips.

Excavation Safety Charts

Whether a nation is at war or in peacetime construction work, the prevention of accidents is important to government, management and employees.

Accidents in a war construction program are more serious than just the loss of manpower. Injury and death or damage and destruction of property can mean delays of vital importance.

Even in normal times a contractor may find his accident costs represent the difference between his bid and that of a successful competitor.

The Corps of Engineers has outlined Safety Requirements that include allowable factors in wire rope use and the handling and storage of explosives on all excavating projects. It is recommended that wire rope in use shall be inspected at the time of installation and once each week and defects such as the following require wire rope to be removed from all load-carrying service.

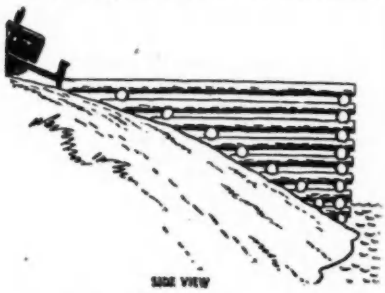
1. Three broken wires on one strand of 6 x 7
2. Six broken wires on one strand of 6 x 19
3. Nine broken wires on one strand of 6 x 37
4. Eight broken wires on one strand of 8 x 19
5. When marked corrosion appears.
6. Wire rope which has been idle for three months or more and subjected to water, moisture, dampness, etc., shall be cut and inspected for internal corrosion.
7. Other wire rope shall be removed from load carrying service when four per cent of the total number of wires are found to be broken.

Safe working loads as specified by the Engineer Corps are given in Table I. The chart shows that a sling with a 30° angle can carry only a 50% load compared with a sling used at a 90° angle.

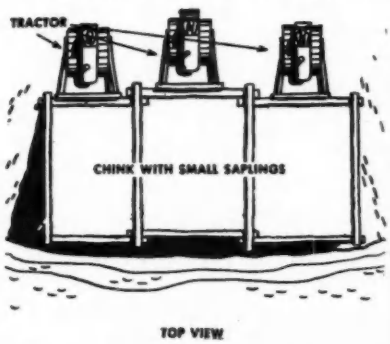
Dry-Shod Jetty Construction

Engineers in SWPA have been building jetties and piers without getting their feet wet by using this unique method, according to the Maintenance Engineer, U. S. Engineer publication.

Soundings are taken to determine



the angle of the sea bed on which the jetty is to rest. When this is determined, a frame of timber or logs, with



joints made log-cabin style, is constructed as close to the water's edge

TABLE I. Diagrams showing how the angle of a sling alters the safe carrying capacity of a load

Plow steel wire rope 6x19 or 6x37 — Diameter	When used straight (90°)	When used at 60°	When used at 45°	When used at 30°
3/8"	1,500	1,275	1,050	750
1/2"	2,400	2,050	1,700	1,200
5/8"	4,000	3,400	2,800	2,000
3/4"	6,000	5,100	4,200	3,000
7/8"	8,000	6,800	5,600	4,000
1"	10,000	8,500	7,000	5,000
1 1/8"	13,000	11,000	9,000	6,500
1 1/4"	16,000	13,500	11,000	8,000
1 3/8"	19,000	16,000	13,000	9,500
1 1/2"	22,000	19,000	16,000	11,000

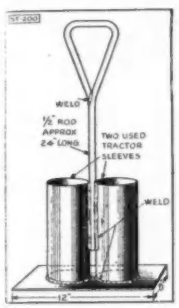
If crucible steel rope is used the load must be reduced one-fifth

as possible. The bottom of the jetty is designed to conform to the angle of the sea bed determined.

When completed, the frame is pushed into position by several bulldozers and then filled with earth, sand or rock.

Welding Rod Carrier

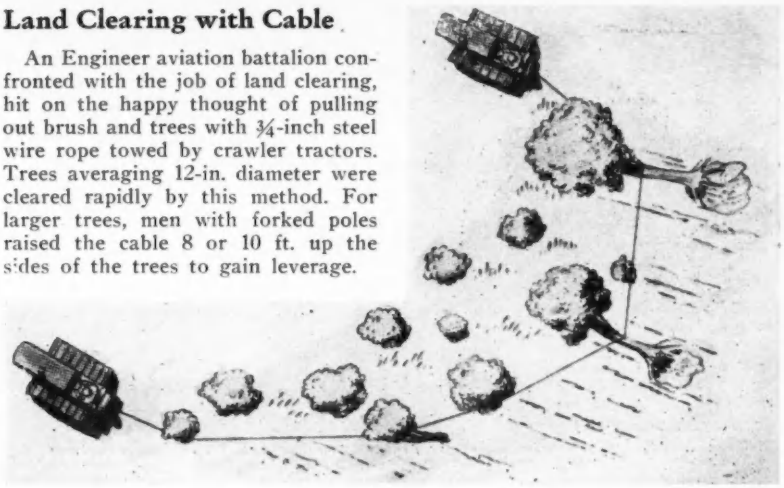
Having tried out several different types of welding rod carriers, it has been found that the one shown in the accompanying photograph and drawing most adequately meets average shop requirements.



The material necessary for the construction of this carrier involves only a flat piece of sheet metal, two discarded 3-inch bore cylinder sleeves and a piece of ½-inch rod. These welded together, as shown in the drawing, provide a very convenient and sturdy carrier. If desired, steel tubing of suitable diameter may be used in place of the cylinder sleeves.

Land Clearing with Cable

An Engineer aviation battalion confronted with the job of land clearing, hit on the happy thought of pulling out brush and trees with ¾-inch steel wire rope towed by crawler tractors. Trees averaging 12-in. diameter were cleared rapidly by this method. For larger trees, men with forked poles raised the cable 8 or 10 ft. up the sides of the trees to gain leverage.



From *The Maintenance Engineer*, Corps of Engineers, U. S. Army.

Improved Horizontal Drill Rig

An electric feed with a one h.p. reversing motor was added to the Permanco horizontal drill used for blasting the 20 feet of shale overburden immediately over the coal vein at United Electric Coal Companies' Cuba No. 9 mine near Canton, Illinois.

Mounted on a rocking base, the motor has a four-step V-belt pulley which connects to a similar pulley on a worm gear shaft. The motor is mounted on the rocking base so that part of its weight adds tension to the belt and also makes it easier and quicker to change the belt. In ordinary drilling, the belt is used in the second smallest groove of the motor

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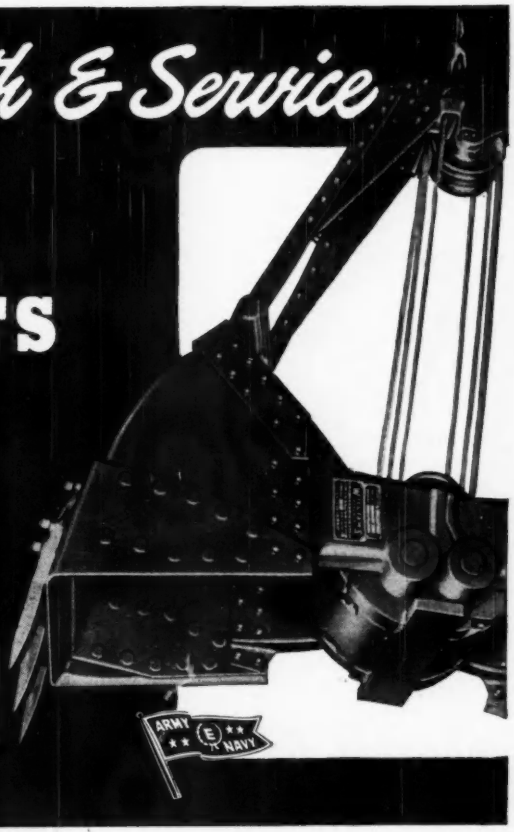

• Drill is mounted on platform and extra auger lengths are carried on truck running board.

pulley, but it can be readily changed to meet drilling conditions as they arise.

The worm gear shaft was connected to the regular feed shaft by means of a jaw coupling which was used in case it ever became necessary to feed by hand.

The entire improvision, installed on the drill at the mine under the direction of Charles Sosey, master mechanic, speeds operation so that it is possible for two men to drill as many as 17 six-inch holes 45 to 50 feet into the bank a day when a third man tamped the holes. Under ordinary conditions, two drillers tamp their own holes and can drill and tamp up to eight holes a day.

• Holding the platform level is accomplished by adjusting it along vertical toothed uprights. If necessary, drill bits may be hand fed.

The drill was mounted on a Ford truck chassis. The truck is backed against the bank to be drilled and power from the 440-volt cable is applied to the rotating drill. The new electric feed geared to the guide rack on the truck forces the bit into the bank. Extra auger lengths, carried on a running board rack, are added as needed.

After the hole is drilled to the required depth, the belt is changed to the largest groove on the motor pulley, the motor reversed and the auger lengths pulled out by power, speeding the operation considerably over the former manual methods of extracting the drill from the hole.

ASD

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Complete integrated units, each designed for specific performance.

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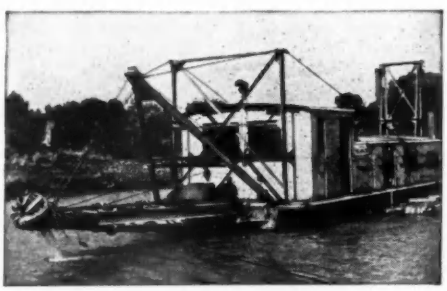
ASD dredges are backed by 40 years of dredge engineering and operating experience.



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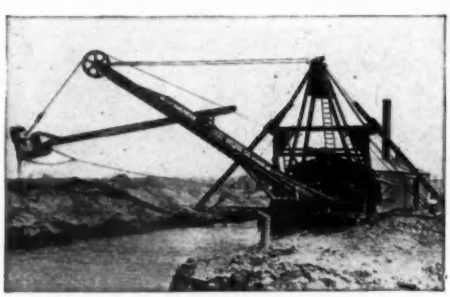
Sizes 8 inches up



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First Bulldozer

Although millions of people think of the bulldozer as the secret and surprise weapon of World War II, its newness is only in its application to military uses. Tractors equipped with bulldozer blades have been used by earthmovers since early in the '20's. Prior to that time, horses provided the power.

The earliest bulldozer of record was offered in a catalog issued in 1917 by Russell Grader Mfg. Co. of Minneapolis, now a part of Caterpillar Tractor Co. of Peoria, Illinois. The name "bulldozer" seems to have come from a heavy horizontal press which bears that name and which has been commonly used in forge shops for many decades past.

BUILD BETTER *Postwar* VACATIONLAND ROADS!

with aggregate from a CEDARAPIDS JUNIOR TANDEM!

When gasoline rationing becomes a memory and the call of the open road can be answered, the new and improved highways that must be built through remote vacationlands will provide many profitable jobs for contractors with the proper equipment. In the Cedarapids line of portable plants there is just the size and type to fit every aggregate production requirement. The Junior Tandem is a typical example, has plenty of belt capacity to handle all kinds of pit conditions, ample extra screen capacity for those tougher screening jobs, and the extra secondary crushing capacity for the production of either fine or coarse aggregate. The entire plant is mounted on one steel truck chassis equipped with pneumatic tires, ready to move to the mountains, parks, or forests from one job to another. Let your Iowa dealer tell you about the profit opportunities you can have with Cedarapids equipment.

Cedarapids Built by IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS
STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

ARMY NAVY

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

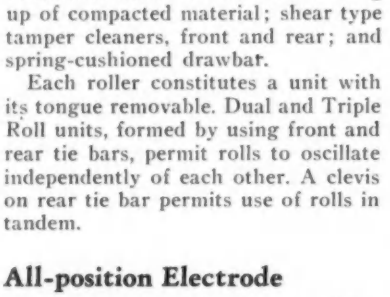
Equipment you ought to KNOW ABOUT

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Sheepsfoot Tamper

Manufacturer: Baker Mfg. Co., 501 Stanford Ave., Springfield, Illinois.

Claims: For use with Allis-Chalmers tractors, this Sheepsfoot Tamping Roller the manufacturer claims has features which include: heavily reinforced box-type welded steel frame; rollers that turn on axles which pass through lubricant-retaining tubes so that weighing fluids cannot come in contact with axles; self-aligning roller bearings on each side of roller; forged tampers with readily renewable heads to minimize tearing up of compacted material; shear type tamper cleaners, front and rear; and spring-cushioned drawbar.

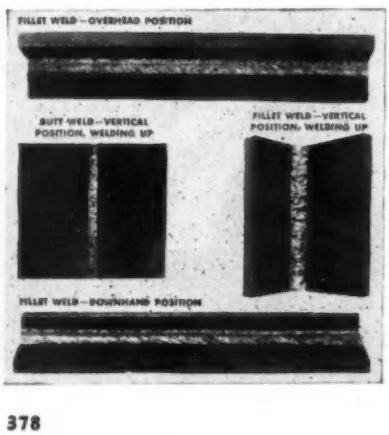


Each roller constitutes a unit with its tongue removable. Dual and Triple Roll units, formed by using front and rear tie bars, permit rolls to oscillate independently of each other. A clevis on rear tie bar permits use of rolls in tandem.

All-position Electrode

Manufacturer: The Lincoln Electric Co., Cleveland 1, Ohio.

Claims: Designated as "Fleetweld 47," this new shielded arc electrode is claimed to have such advantages as extremely low spatter loss, easy slag removal (most "Fleetweld 47" welds are practically self-cleaning), and excellent re-striking characteristics. The rod meets E-6012 and E-6013 specifications and can be used on AC or DC lines.


FILLET WELD—OVERHEAD POSITION
BUTT WELD—VERTICAL POSITION, WELDING UP
FILLET WELD—VERTICAL POSITION, WELDING UP
FILLET WELD—DOWNHAND POSITION

Large single pass fillets for both vertical and overhead work, and complete, easy slag removal on square edge butt welds is claimed. The manufacturer states the rod produces smooth, uniform beads in all positions.

Electric Blasting Cap

Manufacturer: E. I. DuPont De Nemours & Company, Inc., Wilmington 98, Del.

Claims: Nylon-insulated wires and rubber plug closures are reported by the manufacturer to have developed "the greatest advances in half a century" in electric blasting caps. Both nylon and rubber have been allocated by the WPB for the caps.

Abrasion-resistant nylon equal to enamel insulation prevents current leakage with no effects in rapid temperature changes were claimed. Brilliant colors minimize possibility of connection errors. Priming is reported easier and safer with shorter shells that do not sacrifice explosive strength.

Improved Battery

Manufacturer: Ideal Commutator Dresser Co., 4104 Park Ave., Sycamore, Ill.

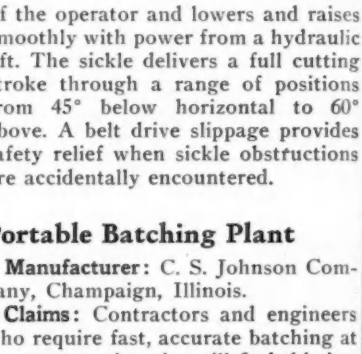
Claims: Forty per cent greater capacity and higher sustained bright light is claimed for this new, improved Rechargeable Flashlight Battery. The Battery may be charged from any AC electrical outlet by means of a rectifier type charger or from the DC ignition system of automobile, truck or bus.

Multi-Purpose Mower

Manufacturer: Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Claims: Unusual stability for operations on extreme slopes at difficult angles is claimed for this new heavy duty, general purpose mower for highway, airport, and miscellaneous service. The unit is mounted on a Model "B" Allis-Chalmers tractor with a variety of travel speeds for all conditions.

The cutter bar is within full view



of the operator and lowers and raises smoothly with power from a hydraulic lift. The sickle delivers a full cutting stroke through a range of positions from 45° below horizontal to 60° above. A belt drive slippage provides safety relief when sickle obstructions are accidentally encountered.

Portable Batching Plant

Manufacturer: C. S. Johnson Company, Champaign, Illinois.

Claims: Contractors and engineers who require fast, accurate batching at the construction site will find this improved plant of value on highway and building projects. It is claimed the unit can be used where distance from ready-mix plants on bridge or other jobs is a handicap. Total bin capacity is 45 tons with one man control.

Concrete Mixer

Manufacturer: Kwik-Mix Company, Port Washington, Wis.

Claims: Built of high strength steel and welded throughout, the new Kwik-Mix 6-S Dandie is assured by the manufacturer to be designed for sturdiness along with light weight. A new selective skip shaker does not engage until the skip is partially emptied and ready for shaking. Exclusive tilted flow-line discharge chute empties faster, it is stated. The mixer handles six cubic feet plus 10%, has pneumatic tires, and trails fast.

New Welding Rod

Manufacturer: General Electric Company, Schenectady, New York.

Claims: Wherever weld requirements include high mechanical properties, good profile, high deposition rate, and good surface appearance the

new flat or horizontal fillet arc welding electrode W-27 will be desirable, the manufacturer states. Heavy machine bases, structural parts, columns, beams, roof trusses, and other heavy metal are typical applications.

The new rod requires less heat input to the joint, reduces warpage, and operates on alternating or direct current with either straight or reverse polarity, it is claimed. Sizes available are 3/16, 1/4 and 5/16 inches.

All-Green Wire Rope

Manufacturer: American Chain & Cable Company, Bridgeport, Conn.

Claims: Impregnated with a special-formula green lubricant, statements that this wire rope has been proved superior to black lubricant rope through years of tests were announced by the manufacturer. "Green-Lube" claims high viscosity and adhesion and is applied hot to the wires to assure complete strand coverage. Inspections revealed that wire-rope with green lubricant were in far better condition than wires under black lubricant. According to the manufacturer, only the highest grade rope is green lubricated while non-preformed will continue to be identified by a single green strand.

Air Safety Valve

Manufacturer: Associated Valve & Engineering Co., 510 No. Dearborn St., Chicago 10, Ill.

Claims: When the flow of free air in a hose line exceeds a pre-determined amount, the Limit-Flo safety valve claims elimination of the dangerous whipping action of the line. It is installed ahead of the upstream end and requires no adjustments. Model 1000 closes air flow at 100 C. F. M. at 85 P. S. I., delivers air through ¾-inch hose up to 100 feet. Used on lines for all air-tool operations.

Electrode Holder

Manufacturer: General Electric Company, Schenectady, New York.

Claims: The new armor-clad (screw type), fully insulated electrode holder is designed from the operator's viewpoint and recommended for use wherever durability, maximum safety, and minimum operator fatigue are desired. Sheathed with an aluminum armor it is stated the holder protects insulation, resists weld spatter, and eliminates possibility of accidental contact with the welding circuit to remain clean and last considerably longer. It holds electrodes up to and including ¼-in. in diameter.

"Non-Spatter" Welding Film

Manufacturer: Lincoln Electric Company, Cleveland, Ohio.

Claims: Reduction of cleaning time and minimizing the adherence of welding spatter to metal are claimed for this new product field tested and found to possess the following characteristics: weld whether film is wet or dry, can be sprayed or painted, paint primers can be applied over the film, removable by washing with water. After film is sprayed to welding jigs, etc., spatter can be easily removed by wiping or brushing, the manufacturer stated.

Four Angle Drill Grinder

Manufacturer: A. D. McBurney, 939 West 6th Street, Los Angeles 14, Calif.

Claims: For accurately grinding round shank drills in four point angles, 49°, 59°, 69°, and 88°, it is stated this fixture will sharpen short, medium, and long twist drills from 1½" to 11" in length. True drill centers, desired clearance, and rounded points are made with guesswork eliminated. Maintenance and salvage of old drills becomes practical with the unit, immediately available without priorities.

To Save TIRES
also Protect TRUCKS AND TRAILERS
GATKE
BRAKE BLOCKS
and LINERS
Custom-Bilt
for the JOB
GATKE Brake Blocks and Liners are made for all requirements of Trucks, Tractors, Trailers and other Heavy Duty Equipment.
For War Essential Conservation of Tires and Equipment, you need these extra performance qualities of GATKE CUSTOM-BILT Brake Blocks.
Smooth, non-grabbing action that adds miles to tire life and avoids strain on men and equipment.
Dependable stopping power for emergencies under all service conditions.
Long wear life that avoids frequent adjustments and saves maintenance.
Comparison is the test. Until you've used GATKE Brake Blocks, CUSTOM-BILT for the job, you can't begin to appreciate the marvelous improvements they offer.
Ask your GATKE Jobber or write.
GATKE CORPORATION
HEAVY DUTY BRAKE BLOCK DIVISION
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Chicago, 1, Ill.

MORE THAN

You get COMPLETE LUBRICATION SERVICE —designed specifically for Contractors — when you call SOCONY-VACUUM! This new time-saving service includes field-proved maintenance schedules — regular on-the-job deliveries and other custom-planned benefits.

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:
Magnolia Petroleum Co., General Petroleum Corp. of Calif.

GAS AND OIL"

EVERY DETAIL of this new service has been planned to help you come out *ahead* in your constant race against time! Out on the job—in your maintenance department—all through your operation, it eases pressure—saves time.

Now, more than ever before, a single breakdown can paralyze a whole team of machines. That's why it is so vitally important to give every part maximum protection. With our *complete* line of quality lubricants, you're sure of getting exactly the *right* oil or grease for every application! No danger of having to make the wrong lubricant "do"—no waiting around for special orders—no necessity for follow-ups.

To help keep interruptions and inventory problems at a minimum, your Socony-Vacuum Representative arranges automatic on-the-job deliveries. He'll also supply you with job-tested maintenance schedules—help your men adapt them to your specific needs and put them into operation.

Additional Socony-Vacuum "plus" services include engineering aid when needed and free training on the Correct Lubrication for every machine you use.

Instead of getting fuels and lubricants, alone, call in Socony-Vacuum and get Complete Lubrication Service for Contractors!

"ON YOUR STAFF—BUT NOT ON YOUR PAYROLL"—
Your Socony-Vacuum Representative

CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE . . .
PLUS
1 ENGINEERING HELP on time-losing operating problems; 2 TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job; 3 PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

"INFORMATION PLEASE" returns from vacation September 10. Until then, hear Rise Stevens and Hollywood Music—Mondays 9:30 P. M., E. W. T., NBC

Shots from the FIRING LINE

Place 4,000,000 Yards To Date in Anderson Dam

The four millionth cubic yard of earth and rock of the 8,650,000 which will comprise the huge Anderson Ranch Dam on the South Fork of the Boise River has been placed, R. J. Newell, Acting Regional Director for the Federal Bureau of Reclamation, said.

The massive structure, which will tower 456 feet above lowest bedrock when completed, will be the highest earth-fill dam in the world. Its present height is approximately 250 feet.

The Bureau of Reclamation and its contractor, the Morrison-Shea-Twaits-Winston Company, are rushing construction in an effort to have 5,600,000 cubic yards of material in place by the end of the working season in the fall so that 45,000 acrefeet of water can be stored in the reservoir next spring to supplement the inadequate supply for the 340,000-acre Boise Project. Utimately the man-made lake will hold 500,000 acre-feet.

During May, 200,000 cubic yards of material, including sand, gravel, clay, and rock, were added to the structure. Progress reports show that, in addition to the material in place, the following percentages of work had been completed by June 1: spillway excavation, 88 per cent; outlet and diversion works, 72 per cent; reservoir roads, 58 per cent; and clearing of the reservoir area, 36 per cent.

Anderson Ranch Dam is a key unit of the Bureau of Reclamation's comprehensive plan for the agricultural and industrial development of southwestern Idaho. Multiple-purpose in scope, it will provide, in addition to a supplemental supply of water for the Boise Project, flood control, silt control, and power development benefits.

Construction of the dam was started in August 1941. When the War Production Board stopped work in the fall of 1942, about 32 per cent of the project had been completed. Work was resumed with WPB approval in the fall of 1943 under the War Food Program. Completion is scheduled for the winter of 1947-48.

Early Scarifier

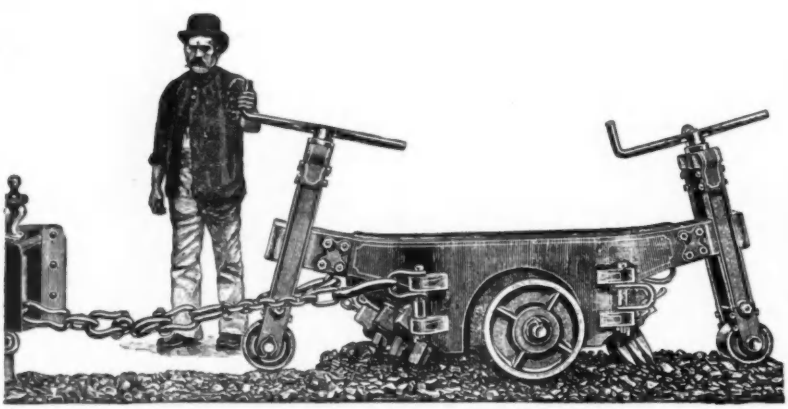
A patent for what is claimed to be the first efficient scarifier was granted in England to George G. Rutty in England 51 years ago. Compared to modern scarifiers it was a crude affair but it did the work it was designed to do and it was far more economical and faster than the manual labor method commonly used up to that time.

Advertising claims for the "Rutty's Patent Macadam Road Scarifier" of half a century ago were that the machine could do in three weeks as much work as could be done by 50 men in three months.

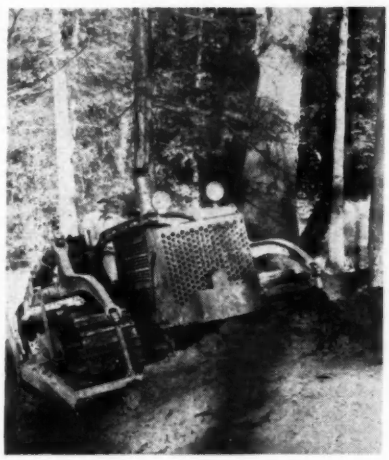
The scarifier was simple in construction. It consisted of a heavy cast iron body balanced on a pair of wheels, one at each end, to adjust the depth of the cut and pitch it forward to get the bite. It would work in either direction to avoid turning it around at the end of each run.

Originally attempts were made to attach the scarifier to the steam roller used to provide motive power, but the vibration was too great and so it was decided to simply tow it by means of heavy chains.

Although its principal use at the time was to scarify macadamized surfaces, it was also used to prepare surfaces of other roads for wood paving and to break ground for ditches and drains.



• Advertising for Rutty's Patent Macadam Road Scarifier in an English publication 50 years ago claimed the machine could do in three weeks as much work as could be done by 50 men in three months. The scarifier was usually towed by a steam roller.



• Building a road through this dense Mississippi growth of trees gives a picturesque setting for this Bucyrus-Erie Bullgrader at work.

Wisconsin Segregates Tax for Highway Purposes

Enacted by the Wisconsin Legislature over Gov. Walter S. Goodland's veto was a bill providing for the segregation of highway-user tax revenues in a single trust fund to be used for highway purposes.

Segregation of automotive tax revenues had been recommended by a state legislative interim committee on highways as necessary to assure adequate funds to finance postwar highway construction. Proponents at a legislative hearing included spokesmen for county boards and highway committees, motorists, organized labor, petroleum and automobile interests, truck owners, chambers of commerce and road builders.

Change Rules Controlling Construction Equipment

Control over 19 items of construction machinery that are expected to remain scarce even though the war in Europe is ended is continued by Order L-192, as amended by the War Production Board.

The amended order is a complete revision of the former L-192, Construction Machinery Division officials said. It eliminates production scheduling, and substitutes List 1, with 14 items, for the former Schedules A and B. These two schedules contained 98 items that were under production and distribution control.

Chief provisions of L-192 as amended are:

Up to 75 per cent of each producer's monthly output of each model of the

MISSISSIPPI WAGONS GIVE PROFIT INSURANCE . . .

. . . WHERE MAXIMUM FLOTATION AND TRACTION ARE MANDATORY FOR HAULING FULL PAYLOADS

Contractors are assured "profit insurance" against tough hauling jobs in sand, mud, and loose dirt when they invest in MISSISSIPPI WAGONS, and here is why:

The MISSISSIPPI WAGON with unusually good flotation provided by the four-wheel trailer and tractor, together with the low-pressure drive tires, must only carry 30 pounds weight a square inch of ground contact area, as compared with 54 pounds weight a square inch with semitrailers hauling the same load.

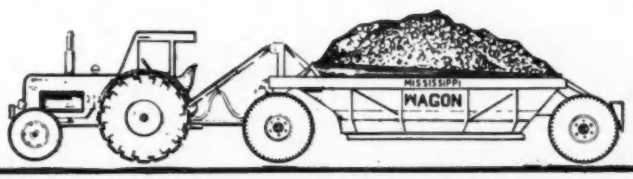
This means profitable hauls over haul roads where semitrailers and other equipment either "bogs down" with a full payload, or operates with part-loads at a loss.

The low pressure tires used on the rear of the tractor require a maximum of only 12 pounds air pressure and provide approximately 350% more ground contact area than high-pressure load carrying tires used on semitrailer units.

Yes, Mr. Contractor, when you own MISSISSIPPI WAGONS you can bid the tough hauling jobs and know if any rubber tired hauling unit can do the job it will be your MISSISSIPPI WAGONS.

AND, IF IT IS A LONG HAUL OVER DEEP SAND YOUR ONLY COMPETITION WILL BE SOME OTHER OWNER OF MISSISSIPPI WAGONS.

"THE WORLD'S MOST MODERN HAULING UNIT."



MRS MANUFACTURING CO.
JACKSON, MISSISSIPPI

items covered by the order is reserved for the military. No distribution control is imposed on the remainder of monthly production of the items on List 1, and they may be sold without restriction. For items on List 2, however, specific WPB authorization is required for the sale of the remainder of monthly output. Application for authorization is made on Form WPB-1319 and is filed in the nearest WPB field office.

If less than 75 per cent of production of a particular item is required by the military agencies during any month, the portion not required may be shipped to other persons, within the provisions controlling sale of List 2 items. A producer may deliver more than 75 per cent of any model to military agencies during any month, but is not required to do so unless more than 75 per cent is called for by contracts with a military agency, entered into before May 17, 1945.

Repair parts are also apportioned to take care of military needs. When a producer's unfilled orders for a particular part exceed his inventory of that part, he is required to reserve up to 75 per cent of his total deliveries of the part for the military. When this condition no longer exists for a particular part, this restriction on delivery is lifted.

Producers are required to file monthly reports (Form WPB-1689) on production, shipments and unfilled orders on or before the 15th of each month.

• This crane is used to lift rocks to clear path for vehicles on Iwo Jima beach. In the surf marines are getting their first bath since D-day.

U. S. Signal Corps Photo

Military agencies as defined in L-192 are the Army, Navy, United States Maritime Commission, War Shipping Administration and Veterans Administration.

Items on List 1 are: Angledozers, bulldozers and modifications thereof; Cranes, attachments for tractor mounting; Crushing plants, portable type; Ditchers, ladder and wheel types; Distributors, bituminous; Finishers, paving, bituminous; Loaders, portable bucket (other than drag, flight or scraper type coal conveyors); Plants, asphalt, including travel mix type; and Power Control units, attachments for tractor mounting, both cable and hydraulic).

Pumps (portable engine or electric-motor-driven pumping units, mounted on skids, with or without handles, or trailer mounted): self-priming centrifugal pumps, horizontal or vertical triplex piston road pumps, ordinarily used for contractor's purposes or by contractors for dewatering and supply; Rollers, road, portable, tandem and three-wheeled types; Scrapers, carrying and hauling, self-propelled; Shovels, attachments for tractor mounting and Winches, attachments for tractor mounting.

Items on List 2 are: Cranes, crawler and rubber-tired mounted power, and modifications thereof, except freight handling lift trucks; Draglines, walking type (other types—see Cranes); Graders, self-propelled, earth moving type; Shovels, crawler and rubber-tired mounted power, and modifications thereof, and Tractors, tracklaying type.

Order L-53 (track-laying tractors) and Order L-53-b (tractor repair parts) were revoked by WPB. These tractors and repair parts are now covered by Order L-192.

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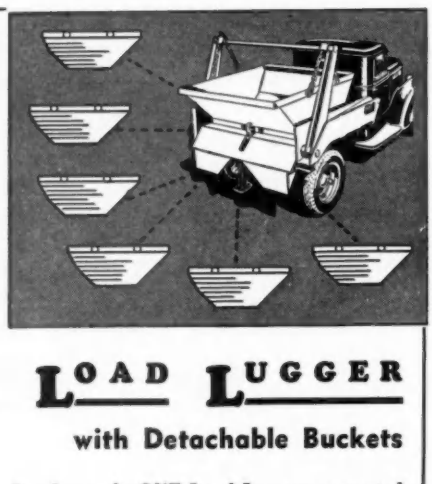
Super-System of Material Handling

FASTER
EASIER
BETTER



BROOKS LOAD LUGGER

with Detachable Buckets

for

LOADING
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It takes only ONE Load Lugger, mounted on a truck chassis, to service from 5 to 10 *bodies* or dump buckets . . . hauling them away while the workmen are filling the others, conveniently spotted on the job. This method cuts costs on your material handling contracts . . . saving time, conserving manpower and reducing maintenance expense. It helps beat the truck shortage because a Load Lugger and set of buckets can handle as much per day as a fleet of ordinary trucks.

Ask for Catalog No. 44

307 Davenport Road, Knoxville 8, Tenn.
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Brooks EQUIPMENT AND MFG. CO.

Post-War Program In India

A ten-year postwar reconstruction plan of road development in India costing $1,350,000,000 has been announced. The Province of Madras which has been allocated $180,000,000 to which the Provisional Government will add $210,000,000 has a road length of 36,676 miles of which only 16,000 miles are in good or fair condition.

Missouri Commission Sets Policy for Federal Road Aid

Missouri's State Highway Commission have approved a policy for allocation of federal aid funds for postwar road construction in Missouri and believes that present revenues will be sufficient to provide the necessary state matching funds.

Carl W. Brown, chief engineer, announced that allocation to urban areas

was made on a population basis using the same formula as applied in the federal aid laws so that the funds would be shared equally by all the cities.

The commission's program calls for $2,821,876 annually to St. Louis for an over-all allotment of $8,465,628 in the three-year period covered by the federal aid law under which the postwar funds are granted. In the same period, Kansas City will be allocated $4,141,044, or $1,380,348 annually.

It was announced that a $28,747,862 construction program already had been prepared, awaiting only the green light of war's end for putting it into effect. Federal aid will provide half of the funds and the state the balance.

Included in this program is $9,302,316 for construction in urban centers of more than 5,000 population; $9,125,100 for supplementary or farm-to-market roads, and $13,320,446 for the main highway system.

Brown said the work already planned called for projects in all parts of the state, including both new supplementary roads and improvements and rebuilding of the existing system.

Missouri, it was estimated, will have about $14,500,000 in its road fund at the end of this year to start matching the total of $43,000,000 which will be made available under the three-year federal aid program. This will permit an immediate start on construction if labor, materials, contractors and equipment are available, Brown said.

Brown estimated that present taxes producing road revenues, such as the gasoline tax and motor vehicle fees, would yield sufficient revenue during the first four years after the war to match the federal aid. He estimated receipts for the first four years after victory at $104,969,000, out of which bond servicing and other fixed costs, such as maintenance and administration would take $74,489,000, leaving $44,970,000 available for construction.

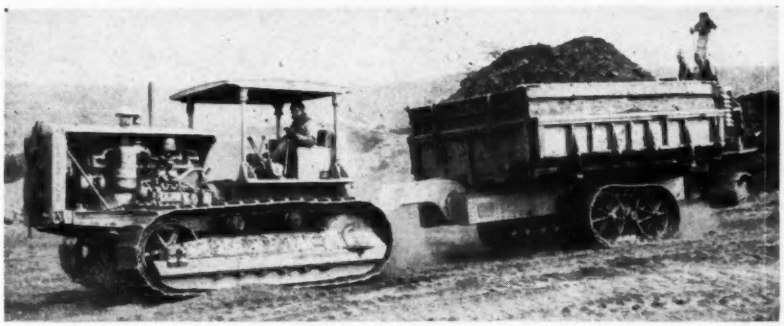
A resolution setting up long-range policy for postwar construction was adopted by the Missouri Highway Commission so that plans could be facilitated. While subsequent commissions could change this policy in some respects, this would not effect federal aid, it was pointed out.

Start River Restoration Project in Pennsylvania

Gov. Edward Martin of Pennsylvania signed a bill appropriating $5,000,000 for an immediate start on the Schuylkill River restoration project.

Heralded as the first real effort to actually dredge the accumulated millions of tons of coal silt and other deposits from the river bed, the measure also pledges the state to co-operate in a $25,000,000 joint state-federal long-range cleanup program. A previously-enacted bill is designed to curb the unrestricted dumping of silt into the waterway.

Governor Martin also approved two other appropriations totaling $26,825,-



• Reclaiming coal at Shamokin, Pa., this Caterpillar D8 tractor and 16 cu. yd. Athey wagon make 15 trips per hour on a 500-ft. haul for seven hours a day. Over a half-million tons of refuse coal are recleaned for use.

"HERCULES" (Red Strand) Wire Rope

For Every Heavy Duty Purpose

ALL wire ropes do not operate under the same conditions: Some must be extra flexible; some are subjected to excessive wear and stress; there are many uses where a combination of severe conditions must be met.

In order to be suitable for every heavy duty purpose, "HERCULES" (Red-Strand) Wire Rope is made in a wide range of constructions — both Round Strand and Flattened Strand — all of which can be furnished either Preformed or Non-Preformed. A "mis-fit" rope, either in type, construction or quality, will definitely increase operating cost.

Moreover "HERCULES" is made of carefully selected and rigidly tested materials. Modern facilities, long experience and advanced manufacturing methods insure correct fabrication.

When you adopt the Red-Strand as your wire rope guide, you are assured of dependable and economical results.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

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DENVER • • • 1554 Wazee Street

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SEATTLE • • 2410 First Avenue South

• Tomahawk Craft Paper Co. of Tomahawk, Wis., uses a Williams log grapple on a Bucyrus-Erie 10-B crane to load pulpwood in northern Minnesota.

000, part of which is to be used for stream clearance projects throughout the state, including financial assistance to municipalities and industry in drawing up plans for waste treatment works.

It has been estimated that the overall program eventually will cost $25,000,000 over a six-year period, with the state contributing a total of $15,000,000 and the federal government furnishing the balance.

Yet to be obtained, the federal government's share would cover dredging and disposing of the silt in the section of the river from Norristown to Philadelphia. The state would finance the dredging of the stream from Norristown to the headwaters in Schuylkill County. It also would construct one or more de-silting basins in the upper stream.

It has been estimated by engineers that preparation of all plans should be completed before next January, leaving 17 months in the 1945-47 biennium (closing May 31 of 1947(for constructive activities.

Engineers estimate it will be possible in the 17-month period to accomplish the following: Make all necessary repairs to those dams which are a component part of the dredging program or are needed to create a de-silting basin; construct such temporary dams as are required for the creation of dredging pools which will be conveniently accessible to suitable disposal areas; complete the construction of a de-silting basin in the river at Auburn, and carry out a limited amount of dredging.

It's easier to lift, lower, push or pull the Simplex Way!
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.

Burton F. Miller Heads ARBA Contractors' Division

Burton F. Miller has been named Managing Director of the Highway Contractors' Division of the American Road Builders' Association, according to an announcement by James J. Skelly, president of the association, and Charles W. Smith, president of the division. Mr. Miller has been with the A.R.B.A. for nine years and since 1940, he has acted as an executive assistant to Charles M. Upham, engineer-director. His duties in this capacity gave him an intimate knowledge of the activities and objectives of the contractors' division.

In announcing Miller's appointment, Smith declared that the volume of postwar construction would far exceed any previous levels. "A program of such proportions will create many new problems, and it is essential that the contractors be prepared through foresight and organized effort to meet these new situations as they arise. The Highway Contractors' Division is planning a substantial expansion of activities in contemplation of postwar highways and airports," he said.

Col. Kittrell Named to Surplus Disposal Job

Colonel Clark Kittrell, Corps of Engineers, U. S. Army, has been named Executive Officer of the Army-Navy Liquidation Commissioner's Office, Thomas Bayard McCabe, Liquidation Commissioner, announced.

Colonel Kittrell, of Davisboro, Georgia, has assumed his duties with the recently organized joint Army-Navy organization which will dispose of all overseas surplus of the armed forces.

The new executive officer joined the Washington staff of Mr. McCabe's office after serving almost a year in North Africa, Italy and France as Engineer, Communications Zone. He has been decorated with the Legion of Merit for engineering work on the defenses of Panama after Pearl Harbor, the Oak Leaf Cluster to the Legion of Merit for meritorious service in North Africa and Italy and the Bronze Star for his engineer activity in south France.

A 1917 graduate of the United States Military Academy, he was commissioned in the Corps of Engineers. After service at Corpus Christi, Texas, and Fort Oglethorpe, Georgia, he was an instructor, Department of Mathematics, United States Military Academy, for four years. He attended Massachusetts Institute of Technology and received the Degree of Bachelor of Science of Civil Engineering in 1923.

His engineering assignments have included lock and dam construction on the Ohio River, flood control work on the Mississippi River, construction on the Fort Peck, Montana, dam; and New Orleans District Engineer for flood control and river and harbor work.

Colonel Kittrell was in Central and

A VALUABLE ROGERS LOW BED TRAILERS FEATURE

FORMERLY tire changing required jacking up the trailer and in some cases the removal of the whole axle unit. A big job in any event that was especially difficult if a tire went out while carrying a load.

With Rogers Trailer this job is comparatively easy, as it is possible to remove any tire without disturbing other casings.

ROGERS BROTHERS CORP. ROGERS HEAVY DUTY Gooseneck Trailers ALBION, PENNA.

EXPERIENCE builds 'em PERFORMANCE sells 'em

PLAN TODAY FOR YOUR POWER TOMORROW

Above: International TD-18 Diesel TracTracTor making a fill. Below: International ID-9 Diesel Wheel Tractor compacting a subgrade.

FOR YEARS International Power has been a partner in the achievements of the construction industry. When the Pacific war is finally won, and International Power is again available in needed quantity, it will play an important part in the great program of peacetime construction and reconstruction.

International Power includes TracTracTors, Wheel Tractors, and Power Units, both Diesel and gasoline. These time-tested, war-proved tractors and engines bear the stamp of International Harvester's years of engineering and manufacturing know-how.

Plan now for your postwar power needs, even though the Armed Forces must still be given the major share of current tractor and engine production. Let the International Industrial Power Distributor analyze those needs with you and recommend the particular kind and size of International Power equipment your work calls for.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL POWER

South America for a year after Pearl Harbor on construction of airfields and defenses that took him from Guatemala to Peru and Ecuador and the Galapagos Islands. He was Division Engineer at Baltimore, Maryland, in 1943, and at Chicago, Illinois, until May, 1944, when he left for Africa.

He is a graduate of the Command and General Staff School, Leavenworth, Kansas, and holds membership in the Society of American Military Engineers and the American Society of Civil Engineers.

Shipments of Cranes and Shovels Show Increase

More than 10,000 power cranes and shovels were shipped during 1944. This was nearly three times the annual average of the period 1937-1941. Throughout 1944 unfilled orders represented over a year's production at current rates and four years' production at 1939 levels. Military interest in this non-military equipment continued high, over 97 per cent of total output went to them in 1944.

These data are based on reports from 26 companies, representing 100 per cent of the industry. Data for 1942 are not available.

Shipments of Power Cranes and Shovels (Units)

Type and Size	1944	1943	1941	1940	1939	1938	1937
Total, All Types	10,052	7,238*	5,125*	3,669*	2,810*	2,523*	3,450*
Crawler Mounted	7,026	5,311	4,307	3,290	2,567	2,310	3,138
⅜ cu. yds.	262	172	661	618	408	442	644
½ and ⅝ cu. yds.	2,474	1,954	868	682	594	581	943
¾ cu. yds.	2,837	1,687	1,367	1,000	831	676	732
1 and 1¼ cu. yds.	153	191	369	297	172	185	316
1½ and 1¾ cu. yds.	562	470	529	335	312	221	325
2 and 2¼ cu. yds.	205	317	190	136	103	78	56
2½ cu. yds.	166	204	181	94	52	64	48
3 cu. yds. and over[1]	367	316	142	128	95	63	74
Rubber Tire Mounted[2]	3,026	1,927	818	379	243	213	312
Under 15 tons	1,931	1,293	261	103	64	61	131
15 tons and over	1,095	634	557	276	179	152	181

*Revised.
[1]Includes walkers, portal and barge and quarry types.
[2]Includes cargo cranes.

Propose Use of National Safety Color Code

Basis of the standard safety color code proposed for national use by the American Standards Association is the safety system now in use in Quartermaster and Army Service Forces Depots.

Recognizing the Army's need for a standard code, Colonel F. B. L. Myer of the Office of the Quartermaster General proposed such a system in April, 1944. Prompting the adoption of the plan was the army's widespread safety problem. Supply depots, with military and civilian personnel running into thousands, are scattered throughout the country. Fires or accidents in these depots hold up shipments of vital supplies to the fighting fronts. Since military personnel are frequently shifted from one depot to another, and untrained soldiers are constantly being assigned, value of standard safety measures assume great importance.

Color schemes for identification of various hazards have been used in the past by industrial plants, but there has been no uniformity in colors used. As a result, spontaneity of action in emergencies is lost, particularly when employees move from one plant to another. Early experiments with paint hues have had a definite bearing on the final selection.

Red, green, yellow, white, and black, and combinations thereof, were the colors finally agreed upon for the Quartermaster and ASF Depots. Red is used to identify fire protection equipment, and danger and stop signals. Green is the basic color for designating safety—the location of first aid equipment, dispensaries, stretchers, gas masks, and safety starting buttons. Yellow indicates the need for caution and marks physical hazards, such as obstacles which may cause stumbling, the projections of machinery, or pillars. Black, white or a combination of these two shall be the basic colors for designating housekeeping, sanitation and traffic markings. Solid black, solid white, or either striped or checker combinations are recommended for direction signs, corners, passageways, stairways, dead ends, traffic guides and refuse cans. Great care has been taken not to conflict with signals used in sea and air navigation or rail transportation.

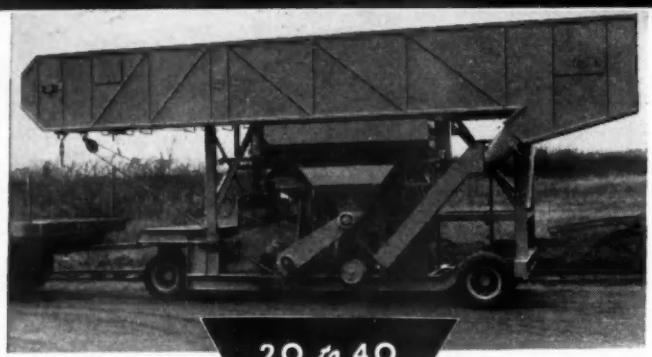
The code, as set up by the American Standards Association, will be sent to safety engineers and interested organizations throughout the country for suggestions and final comment. In 1927, the Association unified on a national scale the colors now used in traffic lights, and in the 26 years of its existence has created more than 700 industrial national standards.

Virginia High School Boys Help Save Roads

High school students helped save Virginia's highways when loss of manpower due to the war threatened to halt operations, R. P. Ellison of the Virginia Highway Department told a technical committee of the American Road Builders' Association.

"Since 1942, an average of 110 boys and girls between 15 and 18 years of age have been employed each summer

STRAYER PORTABLE CONCRETE PLANTS



20 to 40 YARDS PER HR.

Make 20 to 40 yards of specification concrete per hour on the job. One-man operation and a helper to handle cement bags. One hour to set up. Move from job to job. Write for booklet today. 457 Geist Rd.

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Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

Your Output Needs:

1. FAST CYCLE — Balanced design and accurately controlled power gives the 120-B the speedy cycle needed for big output.

2. SMOOTH OPERATION — Operating reactions are smoothly blended for minimum stress and minimum power consumption.

3. EFFICIENT DIGGING ACTION — Long effective upper boom section, big sheaves, and single-part hoist concentrate maximum digging force at the dipper teeth.

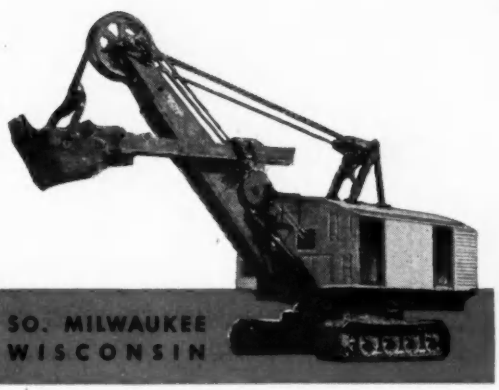
4. BIG OPERATING RANGE — Long range and high lift for easy handling of wide cuts and efficient loading into cars or trucks.

5. FAST FULL SWING — Twin vertical swing units, balanced for smooth action, give quick acceleration and deceleration.

6. COMPLETE MOBILITY — The 120-B can climb grades, dig in or out of a cut in either direction, go anywhere in the pit in a hurry.

7. EASY CONVERTIBILITY — The 120-B can be quickly converted from shovel to dragline in the field.

6L45C



BUCYRUS-ERIE COMPANY SO. MILWAUKEE WISCONSIN

• Seabees at Camp Rosseau receive intensive training in the operation of Bullgraders, shovels and other excavating equipment.

in surveying parties, road design, bridge design, planning survey division, landscape division, equipment division and laboratories," he said. "Many of these youngsters are entering their fourth year of service with the department and have become remarkably efficient technicians and draftsmen.

"With the loss of our experienced staff to the armed services, we were faced with the problem of maintaining 47,000 miles of highways, planning and construction of necessary access roads and preparing for the postwar period," stated the Virginia spokesman. "Denied trained and experienced personnel, we appealed to the high schools. Classes in draftsmanship under engineers were established, and students taking the courses were promised employment in the state department. In addition to these office duties and surveying parties, an average of 320 students worked as laborers on the highways during the Summer in 1942, 1943 and 1944. We can truly say that the boys and girls of Virginia helped save our roads and streets."

In spite of the highway department's limitations, 21 million dollars' worth of access roads were surveyed and planned during the war period, and plans sufficient for the first postwar year were completed, Ellison said. Virginia is among the few states to accomplish this latter task.

WHERE GRADES ARE STEEP AND MUD IS DEEP

LINN contour-following manganese steel tracks permit the utilization of the great power built into these units. This makes possible the negotiation while fully loaded, of steep grades and rough terrain with the maximum of speed, smoothness and economy. Linn Haftraks and Traktailers are built from 5 to 50 tons capacity. Send for catalog.

THE LINN MANUFACTURING CORPORATION

Morris New York

DESIGNERS AND BUILDERS OF OFF-THE-HIGHWAY VEHICLES FOR 29 YEARS

Announce Winners in National Safety Contest

Working nearly 6½ million manhours in 1944 without a disabling injury of any kind, the employees and officials of 84 mines and quarries in the United States have been cited for outstanding safety records by Dr. R. R. Sayers, Director of the Bureau of Mines, who announced the six winners of the "Sentinels of Safety" trophies in the 20th annual National Safety Competition conducted by the Bureau.

The 84 accident-free operations were among 373 mines and quarries in 36 states participating in the competition last year, Dr. Sayers stated, adding that this remarkable accident record in the mineral industries was achieved despite wartime handicaps.

Sentinels of Safety trophies, provided each year for this contest by the Ex-

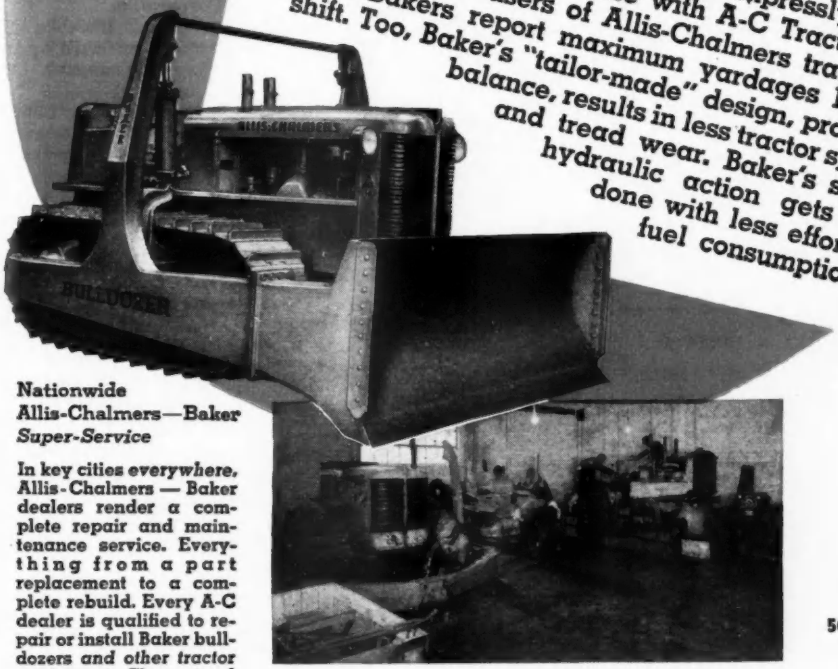
THEY LOOK GOOD TOGETHER
THEY WORK WELL TOGETHER

They Go Together!

Certain things go together like salt and pepper, balls and bats, peaches and cream. Baker Bulldozers or Grade-builders and Allis-Chalmers Tractors are in this category —*they go together!* Bakers look trim on A-C tractors; neither clumsy nor top-heavy. They fit like a glove—just as though they were designed and built by one company under one roof.

Baker and Allis-Chalmers engineers confer together on new equipment or design changes from the moment it goes on the drawing board through production. Other Baker tractor equipment—tampers, rippers, snow plows —as well as bulldozers, are *all* expressly designed from beginning to end for use with A-C Tractors.

No wonder users of Allis-Chalmers tractors equipped with Bakers report maximum yardages handled every shift. Too, Baker's "tailor-made" design, providing proper balance, results in less tractor sprocket, roller and tread wear. Baker's simple, direct hydraulic action gets more work done with less effort and lower fuel consumption.



Nationwide Allis-Chalmers—Baker *Super-Service*

In key cities *everywhere*, Allis-Chalmers — Baker dealers render a complete repair and maintenance service. Everything from a part replacement to a complete rebuild. Every A-C dealer is qualified to repair or install Baker bulldozers *and other tractor equipment*. They stand ready to help you

BAKER

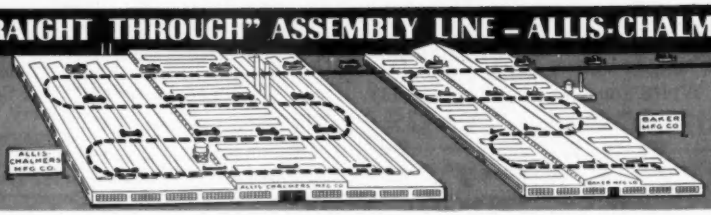
A-C

THE BAKER MFG. CO.

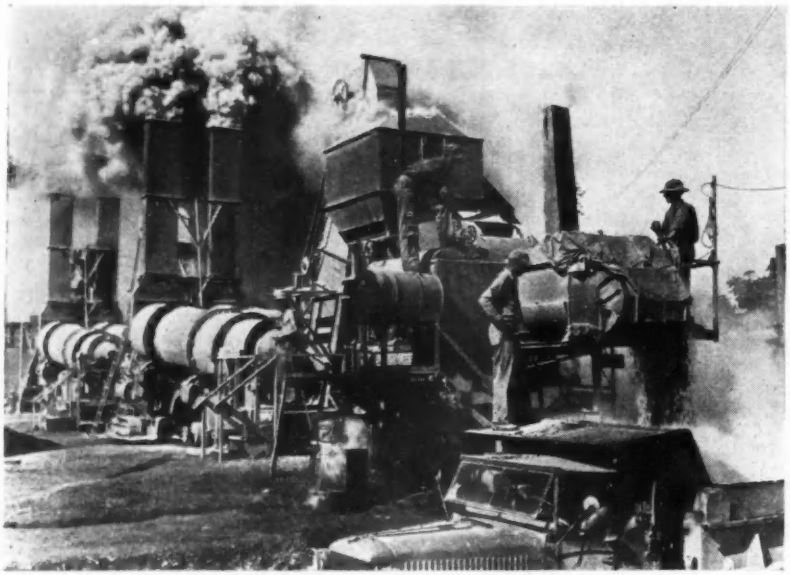
504 Stanford Ave. Springfield, Ill.

If it Concerns Victory, it concerns us!

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.



• Seabees use a Barber-Greene asphalt plant in a central plant set-up turning out asphalt paving mix for landing strips on Guam. The Seabees reported an hourly mix of 160 tons. Novel feature of the set-up was the use of two B-G dual drum dryers in tandem with a B-G bucket loader between elevating the partially dried aggregate.

U. S. Navy Photo

awarded to the top-ranking mines and quarries in the six classifications. In addition, certificates of honorable mention were awarded to 69 mines and quarries for working 30,000 or more man-hours without an accident or for ranking among the first five in each group.

The trophy winners in the open-cut plosives Engineer magazine, were mine and quarry classifications are as follows:

Open-cut Mines: The Danube iron-ore mine of the Pickands, Mather & Company (Balkan Mining Company) at Bovey, Itasca County, Minnesota, for working 364,558 man-hours without a lost-time accident.

Stone Quarries: The Maple Grove dolomite quarry, of Basic Refractories, Inc., at Maple Grove, Seneca County, Ohio, for working 325,147 man-hours without a lost-time accident.

Following were the winners of certificates of honorable mention for outstanding safety records in open-cut mines and quarries.

Open-cut Mines

(All these mines operating during 1944 without a disabling injury)

Bennett iron-ore mine, Keewatin, Itasca County, Minn., operated by the Pickands, Mather & Company (Bennett Mining Company).

La Grange #1 iron-ore mine, Leighton, Colbert County, Ala., operated by the Sloss-Sheffield Steel and Iron Company.

Albany iron-ore mine, Hibbing, St. Louis County, Minn., operated by the Pickands, Mather & Company (Crete Mining Company).

St. Paul iron-ore mine, Keewatin, Itasca County, Minn., operated by the Republic Steel Corporation.

Biwabik iron-ore mine, Biwabik, St. Louis County, Minn., operated by the Pickands, Mather & Company (Biwabik Mining Company).

Columbia phosphate-rock mine, Columbia, Maury County, Tenn., operated by the Monsanto Chemical Company.

Plymouth iron-ore mine, Wakefield, Gogebic County, Mich., operated by the Plymouth Mining Company.

Forsyth - Carterville bituminous - coal mine, Carterville, Williamson County, Ill., operated by the Forsyth Carterville Coal Company.

Richmond iron-ore mine, Palmer, Marquette County, Mich., operated by the Richmond Iron Company.

Dunwoody iron-ore mine, Chisholm, St. Louis County, Minn., operated by the Pickands, Mather & Company (Dunwoody Iron Company).

Erie iron-ore mine, Hibbing, St. Louis County, Minn., operated by the Pickands, Mather & Company (Erie Mining Company).

Volunteer iron-ore mine, Palmer, Marquette County, Mich., operated by the Palmer Mining Company.

Quarries

(All these quarries operated during 1944 without a disabling injury)

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Pa., operated by The J. E. Baker Company.

Walford limestone quarry, Hillsville, Lawrence County, Pa., operated by the Lake Erie Limestone Company.

Steelton limestone quarry, Steelton, Dauphin County, Pa., operated by the Bethlehem Steel Company.

Columbia cement quarry, East Fultonham, Muskingum County, Ohio, oper-

Scrapers and Cableways

for Dig-and-Haul Jobs

Explanation of Picture—Here is a Sauerman Power Scraper of heavy duty type stripping muskeg overburden to uncover a gravel deposit in Alaska. After completing the stripping, this scraper kept right at work hauling the gravel to a portable crushing plant. Sauerman Scrapers are making money for thousands of owners who use this equipment for all kinds of long range material-handling jobs.

With a Sauerman Scraper or Cableway you can make easy work of many material handling projects that would be difficult and costly by any other method.

Digging, hauling and automatic dumping are merged into one operation controlled by one operator. Power requirement is moderate. Maintenance is simple.

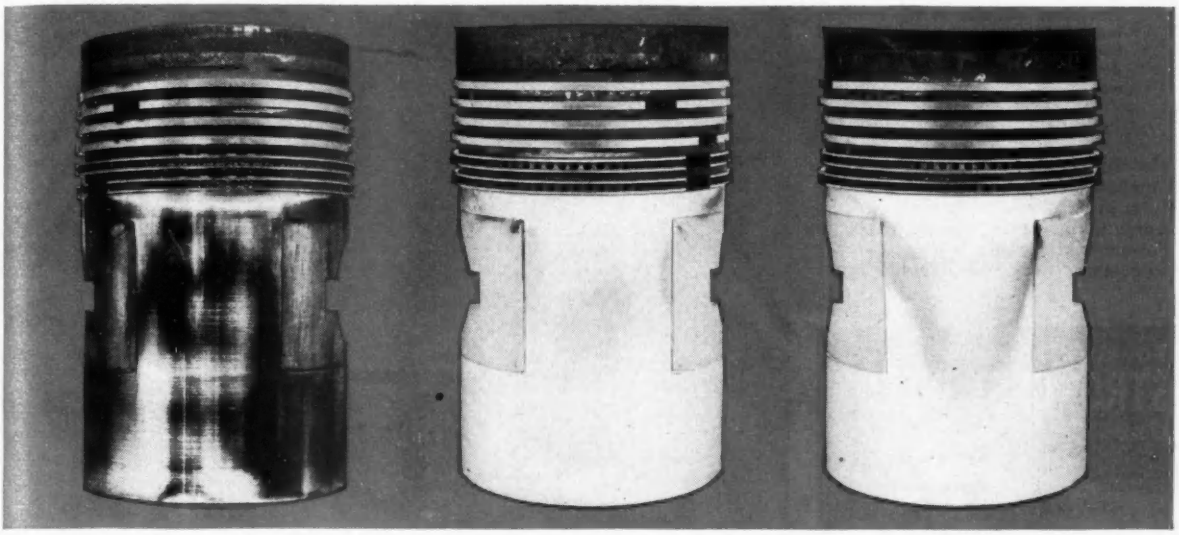
Standard Sauerman machines offer handling capacities from 10 to 600 cu. yd. per hour and operating spans from 200 to 1000 ft. Larger units are built to order.

Specifications of the various sizes and types of machines, with illustrations of their use, are given in the Sauerman catalog. Write for this literature today.

SAUERMAN BROS., Inc.

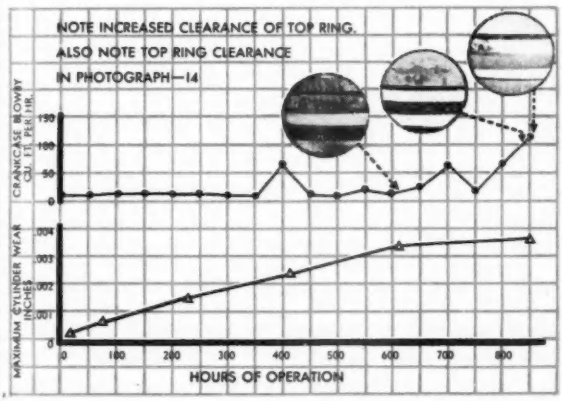
574 S. CLINTON ST., CHICAGO 7, ILLINOIS

How RPM DELO OIL prevents ring sticking

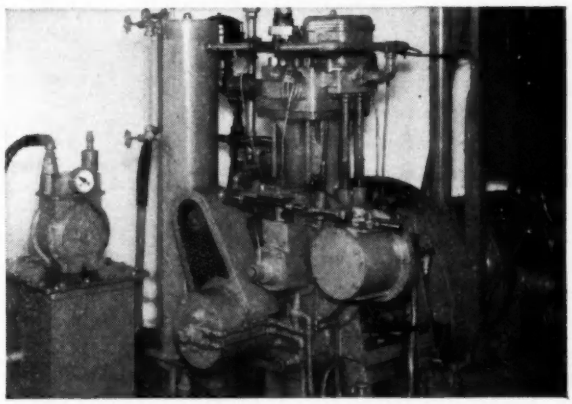


Even the finest uncompounded mineral oil will leave deposits on rings and skirts when operated under severe engine conditions. The above photo shows a test engine piston after 264 hours operation with the finest obtainable uncompounded Diesel engine oil.

Here's the same test made with RPM DELO Oil, only this time for 1000 hours—more than double the 480-hour test required in current military specifications. The photographs above show both thrust and anti-thrust sides of a piston after a 1000-hour test with RPM DELO Diesel Engine Lubricating Oil. Note that RPM DELO Oil has almost entirely prevented any deposits on skirts. Dark areas around rings are only soft carbon, not sticky varnish. The compounding in RPM DELO Oil makes this possible by preventing the initial formation of sticky varnish.



How blowby caused by cylinder and ring groove wear increases rapidly is shown by the above chart. Excessive side clearance caused by ring groove wear allows the ring to rock in its groove and "bite" into cylinder walls. RPM DELO Oil checks this wear at the start by an adhering agent which makes it cling to hot cylinder walls.



This single cylinder laboratory engine is used to measure the ring-sticking characteristics of Diesel lubricants. The test record of RPM DELO Oil has been confirmed by sales of millions of gallons since its development. For more technical information on RPM DELO Oil, write for Booklet T-7, Standard of California, San Francisco 20, California.

Detergent compound to clean engine.

Anti-oxidant to prevent gum and sludge.

Wear-reducing compound.

STANDARD OF CALIFORNIA

RPM DELO Oil has world-wide distribution under the names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Imperial RPM DELO, (CONCENTRATE)

• U. S. Army Engineers use this Bucyrus-Erie power shovel and bulldozers in the Herculean task of clearing rubble of demolished buildings from sites where new structures will rise in the rebuilding of Manila, once modern and beautiful queen city of the Orient devastated by Jap occupation and war.

International News Photo

ated by the Pittsburgh Plate Glass Company.

Folsom granite quarry, Represa, Sacramento County, Calif., operated by the Folsom State Prison.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Company.

Genoa limestone quarry, Genoa, Ottawa County, Ohio, operated by the United States Gypsum Company.

Birmingham limestone quarry, Tarrant, Jefferson County, Ala., operated by the Lehigh Portland Cement Company.

Bethlehem limestone quarry, Bethlehem, Northampton County, Pa., operated by the Bethlehem Steel Company.

St. Stephens limestone and shale quarry, St. Stephens, Washington County, Ala., operated by the Lone Star Cement Corporation.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by the Marquette Cement Manufacturing Company.

Martinsburg limestone quarry, Martinsburg, Berkeley County, W. Va., operated by the North American Cement Corporation.

Ft. Bellefonte limestone quarry, St. Louis, St. Louis County, Mo., operated by the Missouri Portland Cement Company.

Fordwick limestone and shale quarry, Fordwick, Augusta County, Va., operated by the Lehigh Portland Cement Company.

White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by The General Crushed Stone Company.

Thomasville limestone quarry, Thomasville, York County, Pa., operated by The J. E. Baker Company.

Hudson limestone quarry, Hudson, Columbia County, N. Y., operated by

When repairing any of your equipment in the field or in your shop, use Tournaweld. Easy to apply. Stands up in hardest service. Available in 5 types—sizes ranging from 1/8" through 5/16", to meet all heavy equipment welding requirements. Developed and produced by LeTourneau for the manufacture of heavy-duty equipment. A premium rod designed for a special purpose . . . it will pay you to use Tournaweld on your LeTourneau and other construction rigs. TWI

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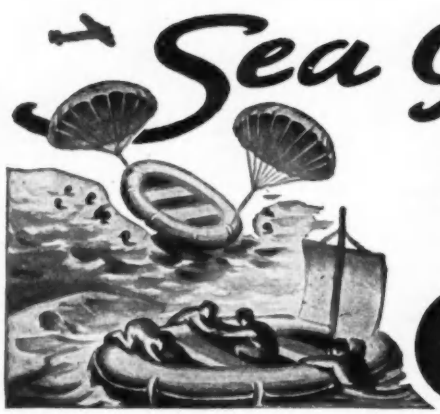
LeTourneau Distributor
R. G. LeTOURNEAU, INC.
Peoria 5, Ill. Stockton, Calif.



Sea Going
LIKE THE RUBBER LIFE RAFT

Certain types of Owen Buckets have grit-tight bearings, special lubrication and other features to adapt them to underwater digging and assure long life under this difficult service.

The OWEN BUCKET Company
6095 Breakwater Avenue • Cleveland, Ohio
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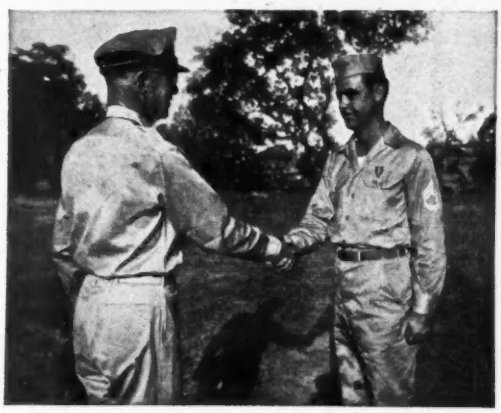
OWEN BUCKETS

A MOUTHFUL AT EVERY BITE



The Pace of Victory Permits Only A Congratulatory Handshake!

American Industry well merits a decoration for its brilliant record in the Mighty 7th! But, as our newly decorated Pacific heroes quickly return to combat, so industrial leaders aren't resting on their laurels. ***Back into Bond action***—they are now busy consolidating recent Payroll Savings Plan gains!

First, many executives are now patriotically working to retain the substantial number of new names recently enrolled during the 7th War Loan. By selective resolicitation, they are urging all new subscribers to maintain Bond buying allotments.

Second, many are also employing selective resolicitation to urge every worker who increased his or her subscription in the 7th to continue on this wise, saving-more-for-the-future basis.

Help to curb inflationary pressures and harvest peacetime prosperity by holding the number of Payroll Savings Plan subscribers—and amounts of individual subscriptions—to the mark set in the Mighty 7th!

The Treasury Department acknowledges with appreciation the publication of this message by

Excavating Engineer

★ *This is an official U.S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council* ★

• Utah Construction Company uses 2½-cu. yd. electric shovel to load coal to trailers in mine near MacDonald, Pa.

the Universal Atlas Cement Company.

Blue Mount trap-rock quarry, White Hall, Baltimore County, Md., operated by The J. E. Baker Company.

Union Furnace limestone quarry, Tyrone, Huntingdon County, Pa., operated by the Warner Company.

Rochester limestone quarry, Rochester, Olmsted County, Minn., operated by the Rochester State Hospital.

Nazareth No. 4 limestone cement-rock quarry, Nazareth, Northampton County, Pa., operated by the Nazareth Cement Company.

Martins Creek No. 4 cement-rock quarry, Martins Creek, Northampton County, Pa., operated by the Alpha Portland Cement Company.

Mitchell limestone and shale quarry, Mitchell, Lawrence County, Ind., operated by the Lehigh Portland Cement Company.

Clinchfield limestone quarry, Clinchfield, Houston County, Ga., operated by the Pennsylvania-Dixie Cement Corporation.

Mason City limestone and clay quarry, Mason City, Cerro Gordo County, Iowa, operated by the Lehigh Portland Cement Company.

No. 3 cement-rock quarry, Coplay, Lehigh County, Pa., operated by the Coplay Cement Manufacturing Company.

Security limestone quarry, Hagerstown, Washington County, Md., operated by the North American Cement Corporation.

Iola limestone and shale quarry, Iola, Allen County, Kansas, operated by the Lehigh Portland Cement Company.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., operated by the Lone Star Cement Company.

No. 4 trap-rock quarry, Knippa, Uvalde County, Texas, operated by the Southwest Stone Company.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., operated by The General Crushed Stone Company.

Wet Weather limestone quarry, Riverside, Riverside County, Calif., operated by the Riverside Cement Company.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., operated by the Lone Star Cement Corporation.

Celina limestone quarry, Celina, Mercer County, Ohio, operated by the John W. Karch Stone Company.

(Continued on page 400)

WHY B G BUCKET LOADERS HANDLE HEAVY JOBS *Better!*

You get peak performance in the heaviest kind of work with a Barber-Greene Bucket Loader—and many extra years of economical service. Look at these advanced B-G mechanical features:

1. Complete crawler mounting means fast, easy maneuverability over rough ground.
2. Special push arms transmit entire crowding thrust of feeding end directly to crawlers.
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4. Cutting action across full width of spiral feeders keeps buckets full.
5. Automatic Overload Release prevents breakage, reduces maintenance expense.
6. Choice of twelve crowding speeds to handle all types of material, stripping, and light excavating.

A Barber-Greene has many other advantages, too. See your B-G representative before you buy any bucket loader.

45-10

Barber-Greene B G *Constant Flow Equipment*

New KOEHRING 605
POSTWAR 1½-YARD EXCAVATOR and 25-TON CRANE
Be among the first to earn greater profits with the new, designed-for-tomorrow 605, latest, but not the last, addition to the Koehring Postwar Line. New ideas in Heavy-Duty excavator design, tested and proven. Plus outstanding, exclusive advantages of earlier Koehring excavators. Greater operating ease. Higher production. More engineered-in strength. Order your Koehring 605 today to get earliest possible delivery.
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Plan Now to Own One
KOEHRING HEAVY DUTY
ARMY E NAVY
HEAVY DUTY CONSTRUCTION EQUIPMENT

• **Members of a British Pioneer Group under the supervision of U. S. Army personnel use Quick-Way truck crane to load ammunition into a U. S. Army truck which takes it to a place in Northern Ireland.** *U. S. Signal Corps Photo*

MACHINERY TRAILERS
DESIGNED
TO TAKE IT!
THAT'S A
LACROSSE
Built by
LA CROSSE TRAILER
& EQUIPMENT CO.
LA CROSSE, WISCONSIN

Shots from the Firing Line

(Continued from page 396)

McLeod limestone quarry, Williston, Levy County, Fla., operated by the L. B. McLeod Const. Company.

Marcem limestone quarry, Gate City, Scott County, Va., operated by the Penn-Dixie Cement Corporation.

Catskill limestone quarry, Catskill, Greene County, N. Y., operated by the North American Cement Corporation.

National City gypsum quarry, National City, Iosco County, Mich., operated by the National Gypsum Company.

Medusa limestone quarry, York, York County, Pa., operated by the Medusa Portland Cement Company.

Evansville cement-rock quarry, Evansville, Berks County, Pa., operated by the Allentown Portland Cement Company.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Texas, operated by the Trinity Portland Cement Company.

Kansas May Double Maintenance Fund

Contingent upon the ability of contractors to obtain manpower, equipment and materials, Kansas will spend twice as much money for highway maintenance this year as last year, Governor Schoeppel was informed by L. L. Marsh, maintenance engineer of the Kansas State Highway Commission. He said the commission plans to make repairs and reconstruct 4,506 miles of highways at a cost of $4,560,133 in the present year.

Montana Votes $12,000,000 Highway Debenture Issue

A $12,000,000 highway debenture issue, to finance the state's share of a program of $46,000,000 of highway construction in the first three postwar years, was authorized by Montana voters at a statewide referendum.

Expressing himself as "very pleased" by the approval of the bond issue, Gov. Sam C. Ford said: "This will make possible the carrying out of our postwar highway construction plans, which already are well developed. We are ready to proceed with construction as soon as men and materials are available. The vote clearly indicates how much Montanans desire an extended system of primary and feeder or farm-to-market highways."

State Highway Engineer Howard W. Holmes declared that "everything is ready for the letting of bids as soon as V-J day and the emergency is declared over."

Chairman H. O. Bell of the Montana Automobile Association commented: "Federal funds have been allocated, plans and surveys have been made, the entire job has been programmed by the highway department and we're ready to go."

Montana's three-year program, including delayed prewar plans, as arranged by the highway department, will allocate $23,557,003 for the primary road system; $17,707,060 for farm-to-market roads; $3,014,356 for grade crossings; $1,610,000 for construction in cities of more than 5,000 population, and $132,948 for cost of plans and surveys.

Besides providing funds to match federal allotments earmarked for Montana, the debenture approved by the voters will retire all present outstanding debentures, totaling about $1,500,000.

Increase Wyoming's Road Value to $100,000,000

Value of Wyoming's highway system will be increased after the war to approximately $100,000,000, it was estimated by State Highway Superintendent J. R. Bromley, who said the completion of $25,000,000 in projects presently planned would raise the system's book value by about one-fourth.

The state's road system now is valued on the department's books at $73,269,347. Since the department was organized in 1917, a total of $81,501,378 has been spent on highways, Bromley said, adding that the difference in cost and valuation is due to depreciation.

Bromley said a postwar annual in-

What YOU SHOULD KNOW ABOUT

MARKLEY-CARTER
Portable
DUST COLLECTORS
"Collects and Controls"

1 Portable units operate through powerful air stream by an effective double separation principle. No dust escapes into the air. Reduces SILICOSIS hazard to safe hygienic limit.

2 When applied to rock drills, SPEEDS UP DRILLING TO 33 PERCENT. Drill steel cuts into fresh rock unimpeded by dust or chips. PROLONGS LIFE OF DRILL STEEL. REDUCES SHARPENING COSTS.

3 Quick detachable hood permits easy inspection of hole and changing drill steel without interference from hood.

4 When applied as industrial unit, collects dust accumulations that are costly and apt to be a hazard both to men and equipment. Keeps your plant, motors and machinery free from harmful dusts.

5 Equipped with Markley-Carter disposal container which permits continuous collection and disposal without closing down the system.

• Write for Bulletin 4402 which describes in detail the advantages of using MARKLEY-CARTER DUST COLLECTOR in your quarry.

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192 ATLANTIC ST., HACKENSACK, N. J. 53 PARK PL., N. Y. 7, N. Y.

WHAT! 200 TONS PRESSURE WITH THAT PORTABLE PRESS?

SURE! STRONG AND PORTABLE . . . THAT'S THE RODGERS!

Model U-2005-8

This is the Rodgers Special Universal Press 200-tons capacity, mounted on a shop stand.

THE RODGERS UNIVERSAL PRESS, like the airplane, is designed for heavy-duty operation, without being cumbersome. It's portable — saves time and labor because you can take it right to your pressing, pulling, or lifting job. 4 models — 50, 100, 150, 200 tons capacity. For complete information, write or wire Rodgers Hydraulic, Inc., 7417 Walker St., St. Louis Park, Minneapolis 16, Minn.

1. For example, the frame rods are heat-treated alloy steel, *3 times as strong* as ordinary steel rods of the same size.

2. We also use heat-treated alloy steel for the frame head and base, which have the capacity of iron castings 4 times their weight.

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Pulling Gears, Sprockets, Pulleys, Couplings, Sheaves, Drums • Wheel Press Work
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ATLANTA: R. S. Armstrong & Bro. Co.
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MICHIGAN, DETROIT: Michigan Tractor & Machinery Co.
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MARQUETTE: Brebner Machinery Co., Inc.
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MADISON: Nagle-Hart Tractor & Equipment Co.
MILWAUKEE: Nagle-Hart Tractor & Equipment Co.

CANADA

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QUEBEC, MONTREAL: F. H. Hopkins & Co., Ltd.

Y-210

SEE OPPOSITE PAGE

• "Stamplicker" laying Hessian mat on an airfield in France. It requires about 16 hours for an experienced unit to cover a 5000 ft. runway. Hessian mat is a burlap type material that is coated with asphalt.

U. S. Signal Corps Photo

come of some $4,100,000 from the road system is anticipated. The state gasoline tax is expected to yield $3,000,000, with the remainder coming from licenses and compensatory fees.

Army Engineers Work on Flood Control Projects

U. S. Army Engineers located in areas recently flooded are preparing plans and specifications for the fmmediate restoration of levees and other structures threatened or destroyed by floods on the Upper Mississippi, Lower Mississippi, Ohio, Missouri, St. Francis, Arkansas, White, Yazoo, Atchafalaya, Trinity and Sacramento-San Joaquin.

This work will be financed through an emergency bill sponsored by Senator John H. Overton of Louisiana, appropriating $12,000,000 for expenditure by the Corps of Engineers, and giving the Secretary of War specific authority to allot from existing flood control appropriations for the immediate prosecution of this character of work, such allocations to be reimbursed from the authorized appropriation when available.

From the $12,000,000 appropriation, $2,320,000 will be allocated for levee repairs on the Lower Mississippi and tributaries. The special $12,000,000 appropriation is in addition to $30,000,000 recently appropriated for Lower Mississippi flood control; $6,993,000 for maintenance of existing flood structures and $7,044,000 for new flood control construction elsewhere in the United States, which appropriations become available on July 1st.

Senator Overton's bill also made available the unexpended balance of $15,000,000 for 1943 flood restoration loans in the hands of the Secretary of Agriculture in order that the Secretary might make loans or grants to farmers to rebuild lost or damaged buildings, fences and outhouses, and to equip the farmers with necessary machinery to conduct farming operations this year.

Name Lineweaver to Reclamation Post

The appointment of Goodrich W. Lineweaver as director of the Branch of Operation and Maintenance of the Bureau of Reclamation, Washington, D. C., was announced by Secretary of the Interior Harold L. Ickes. Mr. Lineweaver has been acting director of the branch since February 5, 1945.

Commenting on the appointment which he had recommended to Secretary Ickes, Commissioner of Reclamation Harry W. Bashore said:

Reclamation Commissioner Bashore announced at the same time, appointment of E. D. Eaton and Alfred R. Golze as assistant directors of the Op-

THERE'S *Extra* OUTPUT IN *Easy* OPERATION

G. I. Joe knows the output value of full, smooth control from operating easy working ⅜-, ½-, and ¾-yard Bucyrus-Eries on the toughest kind of digging the battle areas can offer. Accurate feel, smooth quick response, and properly proportioned power make it easy for the operator to combine crowd, hoist, and swing for big output. He is in direct control during every part of the digging cycle, permitting him to set an even, high-speed digging pace. The conveniently located, easily moved levers and the comfortable cab reduce his fatigue, let him maintain the fast pace for long periods.

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Besides full, smooth control there are numerous other reasons why Bucyrus-Eries are leading yardage-producers. The full Bucyrus-Erie performance story will convince you.

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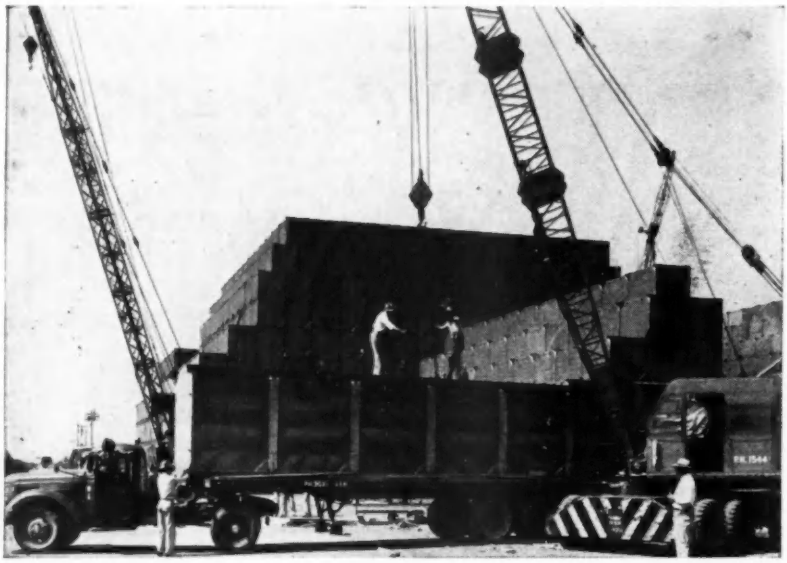

• **Truck cranes used at the Port of Hueneme, advanced base depot, to unload what is termed a ribbon on pontoons delivered by this Standard Model K-8 International truck and semi-trailer owned by the U. S. Navy and operated by a civilian employee. Each pontoon is 5 x 5 x 7 ft. and six of them are bolted together to make the "ribbon".**

eration and Maintenance Branch, on Lineweaver's staff.

John S. Moore, whom Lineweaver succeeds, headed the branch at Denver, Colorado, before its transfer last fall to Washington and is now assistant to the regional director at Boise, Idaho.

Mr. Lineweaver, who is a native of Harrisonburg, Virginia, joined the Reclamation Bureau's staff as a consultant on irrigation and related subjects in 1938.

Reject Tax Diversion Law in Connecticut

A proposal to amend Connecticut's Constitution to restrict the use of all motor vehicle fees and gasoline tax receipts to state highway purposes was rejected by the State Legislative Constitutional Amendments Committee. The proposed state constitutional amendment to ban highway fund diversion had been approved by the 1943 House and would have required approval by two thirds of both houses this year before it could go before the electorate.

Expect Idaho Can Finance Its Own Airport Needs

Idaho Aeronautics Director A. A. Bennett declared that postwar aviation will be able to largely finance its own airport needs in Idaho.

Predicting that consumption of aviation gasoline in the next two years will double the last annual prewar figure, Director Bennett said:

"That means more money to build new and improve old airports. The state at present helps municipalities and counties maintain 40 ports scattered over Idaho. We do this with the 2½ cents per gallon tax collected on all aviation gasoline bought in Idaho. When flying doubles as the war comes to an end, we'll have more money to meet our needs."

Bennett said he thought Gov. Charles C. Gossett was wise in waiting until

QUICK REPAIRS RIGHT ON THE JOB

Don't let breakdowns mean long lay ups! Repair-weld your equipment on the job. Do it in a few hours—save days required to obtain replacement parts.

You can prolong the life of your equipment indefinitely—by building up and hard-surfacing with P&H Welding Electrodes. P&H welding engineers will be glad to help you as to the type to use and procedure to follow. The complete P&H line of welding electrodes includes a size and type for every requirement—for repair-welding; or for building up and hard-surfacing to provide unusual resistance to wear, impact and abrasion.

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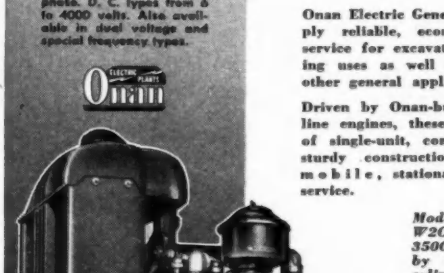
For Excavating and Contracting Work

Models range from 350 to 35,000 watts, A. C. types from 115 to 660 volts, 50, 60, 180 cycles, single or three-phase and 400, 500 and 800 cycles, single phase. D. C. types from 6 to 4000 volts. Also available in dual voltage and special frequency types.

Onan ELECTRIC PLANTS

Onan Electric Generating Plants supply reliable, economical electrical service for excavating and contracting uses as well as for scores of other general applications.

Driven by Onan-built, 4-cycle gasoline engines, these power units are of single-unit, compact design and sturdy construction. Suitable for mobile, stationary or emergency service.



Model shown is from W2C series; 200 to 3500 watts; powered by Onan-built, two cylinder, water-cooled engine.

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Write For Folder 690-A describing complete Onan Line

the war's end to ask legislators to prepare aviation needs. Fliers and aviation industry managers, he said, do not know themselves what lies ahead.

"One thing," he added, "is certain: There will be a big increase in flying. We aren't making any wild guesses as to how big the increase can be. We might lose our heads if we try it."

The recently-completed Civil Aeronautics Authority survey of national airports outlines federal maintenance and improvement plans for Idaho to cost $750,000 to $1,000,000. Bennett noted that the CAA already helps to operate Idaho airports at Lewiston, Coeur d'Alene, Pocatello, Montpelier, Dubois, Gooding, Burley, Malad, Idaho Falls and Boise, and might soon add Twin Falls and Mountain Home to the list.

Ban Off on Gold Mining

Resumption of gold mining will be permitted through the revocation of Order L-208, effective July 1, 1945, the War Production Board announced Order L-208 was issued on October 8, 1942, to conserve machinery and supplies for the more vitally needed lead, zinc and copper.

OBITUARY

George Tilley Seabury

George Tilley Seabury, 65, for the last 20 years secretary and executive director of the American Society of Civil Engineers, died May 25 in Post-Graduate Hospital, New York, of a coronary thrombosis. His residence was in New York City.

Mr. Seabury had planned to retire June 1 as secretary of the society, whose affairs he directed through 64 local organizations. His previously-selected successor as national executive of the society, which has a membership of 21,000, is Col. William N. Carey, who has been serving as chief engineer of the Federal Works Agency.

Born in Newport, R. I., Mr. Seabury received a degree in civil engineering from Massachusetts Institute of Technology in 1902. He immediately entered the field of heavy engineering construction, serving several construction corporations in New York.

Mr. Seabury served from 1906 to 1915 as an engineer for the New York Board of Water Supply, working on the Ashokan reservoir and dam, and later on the Kensico reservoir and dam near White Plains, N. Y. In 1915 he was named division engineer in charge of $18,000,000 of construction for the new water supply system in Providence, R. I.

He served during the First World War as a major in the Army's quartermaster department, supervising construction at several camps. In June, 1918, he established George T. Seabury, Inc., a firm specializing in heavy construction in New England, and was its president and general manager for four years. In 1923 and 1924 he was manager of the Providence Safety Council.

He took office as secretary of the American Society of Civil Engineers on January 1, 1925. Since that time the society's membership, exclusive of thousands of engineering students affiliated with the organization, has nearly doubled. A full-time office in Washington, D. C., and local groups throughout the country have been established. In 1930 he founded the national professional journal, Civil Engineering, for the society. Another feature of his administration was the society's election in 1927 of Miss Elsie Eaves as its first woman corporate member.

Mr. Seabury was president of the Engineering Societies Personnel Service, Inc.; vice president of the American Engineering Council, secretary of the Engineers Council for Professional Development, the Engineers Joint Council and the Committee on the Organization of the Engineering Professions as a Whole. He also was an honorary member of the Koninklijk Instituut Van Ingenieurs, Netherlands engineering society; the Engineering Institute of Canada and Tau Beta Pi and Chi Epsilon, honorary fraternities. He was a member of Delta Upsilon fraternity and of the Masons.

Surviving are his widow, Mrs. Margaret Howard Knight Seabury, and one daughter, Mrs. Medley P. Ray of New York.

Dragline Practices

(Continued from page 369)

machine and four mats is the minimum that should be used at a time, although it is advisable to use more than four.

Mats need not be laid tightly together except in very soft going. When operating on very soft material the mats should be laid close together for good bearing and to keep the "soup" from working up between and onto the mats. Don't put dirt on mats when it is raining for a wet clean mat is not as slick as a wet muddy one.

Do not attempt to negotiate difficult places by building extra long mats. The added weight of the long mats will sink or break the ones the dragline is resting on when lifting or swinging new mats in place. Keep the machine on the center of the mats and turn the mats over occasionally to get some wear out of the other side. A few bolts in the track will keep the dragline from slipping while operating on mats.

When lifting a mat off very wet ground or ooze it is best to give the mat a slight kickback or twist to release the suction before attempting to lift it.

MEMO TO ALL CONSTRUCTION SUPTS:
What's this about HAISS buckets giving 40% more efficiency?
Get the facts
C.B.E.
HAISS
HI-POWER
For Catalogs, Prices, Deliveries
Write or Wire
GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N. Y.

NOT in the *Contract*

A young mother, somewhat embarrassed, has just unburdened herself and told her son the facts of life. At the end she said, "Now if you want to know anything else, ask me."

The lad pondered a moment, then said: "How do they get the Saturday Evening Post out on Tuesday?"

Employer: For this job we want a responsible man.

Applicant: Then, that's me. Everywhere I've worked, when something went wrong they told me that I was responsible."

Old Colored Mammy: "Ise wants a ticket fo' Florence."

Ticket Agent (after ten weary minutes of thumbing over railroad guides): "Where is Florence?"

Old Colored Mammy: "Sitting over dar on de bench."

The theater was crowded and a devoted young couple had been forced to accept single seats. The young lady didn't like the arrangement and looked about for some way to remedy matters. Then it occurred to her that her neighbor might be willing to exchange seats with her boy friend.

So she leaned over and whispered, "Pardon me, are you alone?"

The meek little man gave no sign of having heard. She repeated her question a little louder.

At that the man turned slightly toward her and keeping his eyes on the screen murmured between clenched teeth:

"Hellsafire—cut it out, will you—my whole damn family's here!"

Lady (at party): "Where's that pretty maid who was passing out cocktails a while ago?"

Hostess: "Oh, are you looking for a drink?"

"No, I'm looking for my husband."

"But I tell ya, I can't talk him out of it. He insists we're going the wrong way on this street."

A cow was crossing the road and the speeding motorist rammed into it. Out of the farm house ran the owner, shouting angrily.

"Now, now," said the motorist. "Keep calm. I'll replace your cow."

The farmer stopped suddenly, looked him up and down, and then spat.

"Shecks!" he said. "You can't give milk."

"Judge, I want to have my name changed."

"What is your name?"

"Joe Stinks."

"Well, I don't blame you for wanting to change it. What do you want to change it to?"

"Charlie Stinks."

A newly married doctor was walking with his wife when a beautiful girl smiled at him. Wifey became suspicious and asked who the lady was.

"Oh, just a girl I met professionally," came the reply.

"No doubt," meowed his wife, "but whose profession, yours or hers?"

A soldier enroute back to camp after his furlough was persuaded by a pretty, tearful blonde to give her his seat on the plane.

He wired his commanding officer: "Gave berth to a girl. Arrive by next plane."

Back came the reply: "Congratulations. Your next confinement will be in the guard house."

An officer came upon a sergeant who was yelling at two soldiers bathing in a flooded foxhole.

"What's the trouble here, Sergeant?"

"Why, these dirty bums are washing themselves in the water they're going to sleep in, sir."

Two WACs got on a Pullman car crowded with soldiers.

One of them was frightened and locked herself in the drawing room.

The other remained calm and cool and collected.

Teacher: "For what was Louis XIV chiefly responsible?"

Johnny: "Louis XV."

The one who thinks our jokes are poor
Would straightway change his views
Could he compare the jokes we print
With those we cannot use.

Notes from the manufacturers

John A. Roebling's Sons Company, Trenton, N. J., has named former general manager of sales, Ernest C. Low, vice-president in charge of sales.

Blaw-Knox Company of Pittsburgh, Pa., announces the appointment of Acme Wire & Iron Works of San Antonio, Texas, and C. H. Jones Equipment Co. of Salt Lake City as its bucket distributors in their respective areas.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed Marshal L. Noel general sales-manager of tractor division, William J. Faulkner industrial sales-manager, Ernest Frank in charge of wheel tractor sales, and Boyd S. Oberlink assistant to vice-president W. A. Roberts.

American Hoist & Derrick Company of Saint Paul, Minn., recently appointed P. A. Neff Machinery Co. of Miami, Florida, and Hall-Perry Machinery Co. of Butte, Montana as exclusive distributors of its construction equipment.

American Chain and Cable Co., Inc., Bridgeport, Conn., now accompanies several types of their wire rope slings with certificates of test and registry. The certificate assures slings made from preformed rope of improved plow steel and full strength of body along with safety factor record, proof load, and sales conditions. The plan was announced as new to the industry.

Gar Wood Industries, Inc., of Detroit, Mich., appointed General Machinery Co. of Spokane, Wash., and Equipos Hobbs S. A., Mexico City, as distributor of its hoist and body divisions.

New trade literature

Title: "Linn Haftrak Bulletin"

Subject: Illustrated and described in this bulletin are the Linn Haftrak and Catruk vehicles for off-the-highway service. Types pictured include Linns with bodies for moving rock, coal, ore, logs, and snow where steep grades, deep mud, snow and sand are encountered.

Where to Get: The Linn Mfg. Corp., Morris, N. Y. (Free)

Title: "The Story of the Diesel"

Subject: The growth and present status of the diesel industry, what a diesel engine is and how it works, its application in all industries, diesel in war, its advantages and efficiency—all are interestingly told in this story presented in a 32-page non-technical book in easy-reading, concise style.

Where to Get: Diesel Engine Manufacturers Association, One North La Salle St., Chicago 2, Ill.

Title: "Applications for Manganese Steels"

Subject: How non-magnetic manganese steel finds various uses in construction work is the subject of this large size book. Complete facts about the steel and a section titled "The Story of Manganese Steel" make this piece interesting reading.

Where to Get: American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill. (Free)

Title: "Glimpses of LaCrosse Trailers"

Subject: The features of many styles of trailers for all types of hauling including the movement of excavating equipment are copiously illustrated in this spiral-bound 32-page colored book. Specifications help make comparisons of the various units.

Where to Get: LaCrosse Trailer & Equipment Co., LaCrosse, Wis. (Free)

Shunk
GRADER AND SCARIFIER BLADES
For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—
CUTTING EDGES, WEARING BOOTS, BACK SLOPERS, EXTENSION BLADES, MOLDBOARDS and SCARIFIER TEETH
50 years of specializing in the manufacture of Construction Equipment Blades has developed for your benefit a quality of special steel, milled through our own rolls and forged at the edges to give that extra cutting and wearing quality you need.
Furnished in various widths, lengths, and thicknesses, punched ready to fit your machine.
Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.
Shunk
MANUFACTURING COMPANY
Established 1854
BUCYRUS, OHIO

HAYWARD BUCKETS
WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

A Time-Saving ACCESSORY
Beco BLOCKS & LININGS
Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough — that's why replacements and adjustments are less frequent.
T34A
BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

One Model 101 Lima 1¼ cu. yd. shovel, shop No. 110 powered with Waukesha gasoline engine. Box 3108

Lorain 40 combination ¾-yd. shovel and dragline. Rebuilt and guaranteed.

Osgood 1½-yd. combination diesel shovel and dragline. Dragline boom 60'. Rebuilt and guaranteed.

701 Lima dragline, 70' boom, 1⅜-yd. Page bucket. Rebuilt and guaranteed.

801 Lima dragline, 70' boom, 2-yd. bucket. Hesselman oil engine. Rebuilt and guaranteed.

1001 Lima dragline, 80' boom, 2½-yd. bucket. Hesselman oil engine. Rebuilt and guaranteed.

FRANK SWABB EQUIPMENT COMPANY
Hazleton, Pa.
Phone 3906

2T Bucyrus-Monighan dragline.
30B Bucyrus-Erie steam shovel.
18—Heavy duty International trucks with 8-10-yd. dump bodies.
The right equipment for pit, quarry and stripping operations.
Prices on request.
Stevens Bros. Coal Co.
St. Paul 1, Minn. and Garrison, No. Dakota

Model 20 International crawler tractor. Needs some repair. As is—$500.00.
George Riemer
2900 Armitage Avenue
Chicago 47, Ill.

Welding and Cutting Outfits, Torches, Regulators and Gauges, for heavy, medium, and light welding and cutting. Superior Oxy-Acetylene Co., Hamilton, Ohio.

Diesel dragline on trucks, 3-yd. RC bucket, 110' boom. Rebuilt 1944, all in A-1 shape.
Monighan 3-yd. electric dragline, late walkers.
Monighan real 2-W full Diesel dragline, 70' boom.
P&H 900 and 780 Diesel cat. drags., 4 and 2-yd.
¾-yd. crane and hoe, new '38. Reblt. A-1.
Galion 101 and A-W Diesel patrol graders.
Reblt. Diesel tractors inc. bulldozers. Int. TD-18, Cat. 50, and Cat. D-8 inc. Angledozer.
Athey Mobiloader for D-8 Cat. tractor.
75 HP A.C. electric hoist. 3 drum. Like new.
Owen 1¼-yd. M clamshell. Others ¾ to 4-yd.
Link-Belt K-55 fairleads. Misc. P&H 206 parts.
James Wood
53 West Jackson Chicago 4, Ill.

Complete shovel front for Bucyrus-Erie 32-B Type M Machine No. 11337.
CALNAUGHT CONTRACTING CORPORATION
328 Detroit St. Portsmouth, Va.

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3 Coleman trucks, four wheel drive, model X, 7½-cu. yd. steel dump bodies. Heavy duty hoists. Buda L-525 engines. All recently overhauled. Trucks ready for heavy work. Good tires with spare 11.00 or 10.50 x 24 for each. Many extra repair parts included. Priced very reasonably at $750 each.
COOLEY BROTHERS
Lehigh, Oklahoma

DRAGLINE ATTACHMENT
Removed from 75-B Bucyrus-Erie Electric Shop No. 11595. 2 Piece 60' lattice boom. Capacity 40 tons at 20'. Complete with control motor, drum and fairleads. Immediate shipment.
ATLANTIC EQUIPMENT COMPANY
503 Broad St. Station Bldg. Phila. 3, Pa.
(Rittenhouse 8583)

FOR SALE
Allis-Chalmers Roll Crusher type XX Size 52"x24"; weight 142,000 lbs.; shaft and core only 18,800 lbs; swivel head 11,250 lbs.; base 29,000 lbs.; large pulley 19,000 lbs.; small pulley 4,000 lbs. Cost new $21,250. Condition good with exception two spokes broken in large pulley 22"x10' but repaired. Have half section of spare pulley in good shape. Other section of this spare has broken spoke but is repaired. Small pulley is 14"x4'. Address inquiries to:
F. W. Evans Mines
301½ Joplin Street Joplin, Missouri

FOR SALE
ALL OR IN PART
SAND AND GRAVEL PLANT INCLUDING JAW CRUSHER, GYRATORY CRUSHER, CONVEYORS, VIBRATING SCREENS, SAND CLASSIFIERS, EXTRA HEAVY SCRUBBER, WATER PUMPS, SAND PUMPS, FEED-O-WEIGHTS, WEIGHTOMETERS, TRESTLE AND TRIPPER AND AUXILIARY EQUIPMENT.
ALSO
APPROXIMATELY 9 MILES OF CONVEYOR COMPLETE WITH BELTING, PULLEYS, TROUGHING AND RETURN IDLERS AND DRIVE EQUIPMENT.
ALL OFFERED SUBJECT TO PRIOR SALE.
FOR PARTICULARS WRITE
COLUMBIA CONSTRUCTION CO., INC.
BOX 579, REDDING, CALIFORNIA
TELEPHONE—REDDING 1440

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS
2—¾ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1 cu. yd. Drag Shovel Dipper—29-B.
1—1¼ cu. yd. Cast Front Dipper—GA-3.
1—1¼ cu. yd. Drag Shovel Dipper—33-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper—42-B.
1—1½ cu. yd. Snow Loading Dipper—10-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2¼ cu. yd. Inserted Type—55-B.
1—2½ cu. yd. All Cast Dipper—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.
F.O.B. Works
Write for any further information desired.
BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

Used contractors' equipment including: 1 Caterpillar tractor; 5 scrapers; 1 grader; 1 steam hammer; 1 model 372 Marion shovel; 1½-yd. dipper; 5-yd. dragline bucket; 3 air compressors; 1 blower; 1 grout mixer; ventilating pipe; 1 single drum mine hoist; 7 light plants; 2 International 100 H.P. 60 KUA generator sets; 160 H.P. Waukesha gas power unit.
Above equipment is located in Middle West and is offered subject to prior sale.
Box 3107

FOR SALE OR RENT
½-yd. truck crane. TD-18 International with Bucyrus-Erie 'dozer.
George Riemer, 2900 Armitage, Chicago 47, Ill.

WANTED TO RENT OR BUY
1¼ to 1½-yd. Crane
Late Model
Austin Road Company
P. O. Box 1590
Dallas 8, Texas

Two experienced highway engineers seek backing for airport, highway and sewer work. Equipment and jobs available. Silent or working partnership agreeable.
Box 3099

WANTED TO RENT OR BUY
¾, 1, or 1¼-yd. Skimmer Scoop for either Lorain, P&H or Northwest
Austin Road Company
P.O. Box 1590 Dallas 8, Texas

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2 to 2¾-yd. electric crawler shovel, 2200 volt with Ward-Leonard control; also, 2½ to 3-cu. yd. capacity, diesel powered, dragline. Also, two diesel powered well drills 9" bits.
A. J. O'NEILL
Lansdowne, Pa.

WANTED

Manager for our Machinery and Equipment Dept. Experienced with machinery and equipment used in heavy industries—like cranes, ground and overhead; steel buildings and structures, power plants, mining, contractors, etc. Drawing account and participation. Unusual opportunity for good high grade man. Confidences respected.

IRON & STEEL PRODUCTS, INC.
40 years' experience
13474 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

F. A. Howe, Superintendent, Fall Brook Coal Co., Antrim, Tioga County, Pennsylvania, has steady jobs available for operators and cranemen experienced on 320-B steam shovel.

HELP WANTED

CRANE OPERATOR WANTED
Experienced crane operator to work in Milwaukee, Wis. Must be familiar with P&H or Koehring equipment and be able to make minor repairs. Good, steady working conditions. WMC rules.
Box 9243

Expert operator for large steam driven stripping shovel in South America. Box 9246

POSITIONS WANTED

Graduate civil engineer with 30 years' experience in general, civil and construction engineering; past 20 years for U. S. government. Now commissioned reserve officer doing administrative work for past 10 years covering all types of C. E., construction engineering. Age 51, married. Seeking a permanent connection in 6 months to a year. Box 9245